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ORIGINAL COMMUNICATIONS.

INTRODUCTORY ADDRESS, RUSH MEDICAL COLLEGE

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Professor of Obstetrics and Diseases of Women and Children.

GENTLEMEN OF THE CLASS:

We have assembled this evening to inaugurate the nineteenth annual course of lectures in Rush Medical College, and the pleasing duty is devolved upon me of extending to you a cordial greeting, and in behalf of my colleagues, the faculty, to bid you welcome.

The pleasure of this duty, is enhanced in no small degree by the relatively large number present on this occasion, of those who have identified themselves with the class, and thereby with the interests of this institution.*

At a time like the present, unparalleled in our national history, when the whole country is distracted by the prevalence of intestine dissensions, and the minds of all classes of our citizens are engrossed by the excitements of the passing hour, or by unpleasant anticipations of the future; it was not expected that any very large proportion of the people, and especially of the youth of our land, would remain indifferent or unmoved by the wildness of the scenes through which we are now passing, so as to turn aside from the broad highway of public commotion, and take their way, unmoved by excite-

* The number of students in attendance at the opening of the current course, exceeded that of any similar occasion since the organization of the College.

ment, in the quiet and peaceful paths of scientific study and investigation.

Youth is emphatically the period of life, when the call of patriotism and the allurements of martial glory are most sure to excite in the breast a prompt response, and incite to deeds of noble daring. The dark cloud of war which now fills the whole national atmosphere, and obscures from view almost every object of ordinary interest, diverts the attention of the student, as it has interrupted the chosen vocation of all classes of society. It requires the change of but a single word, to make the language of the prophetic bard applicable to this country and to the present time:

> "Now all the youth of America are afire
> And silken dalliance in the wardrobe lies,
> Now thrives the armorer; and honor's thought
> Reigns supreme in the breast of every man."

From the effects of causes so potent, in arresting progress in scientific pursuits, and operating adversely to the interests of literary institutions, the friends of Rush Medical College anticipated no immunity. The fact, however, that you, gentlemen, are here this evening as Medical Students, and also that you represent so extensive a portion of our common country, even under the prevailing unsettled condition of public affairs, does not lead to the inference of a want of patriotism on your part; but rather that you are in the direct line of duty; for now, more than ever before, is there a demand for that skill in Medicine and Surgery which it is your aim here to acquire. That your numbers are so much greater than the most sanguine had dared to hope, is a source of great gratification to the faculty, and a reasonable ground for the friends of the institution to felicitate themselves upon its flourishing condition, and upon which they may predicate its future stability and usefulness.

The increasing favor and confidence with which this College is regarded by the profession throughout the country, furnish the stimulus, if other motives were wanting, to incite each member of the faculty to the most lively zeal in advancing

the best interests of the classes, which annually convene within its walls, and to unremitting industry to render the course of instruction here, in every department, as complete and perfect as in any institution in the country. The faculty fully appreciate the importance of maintaining in this city, a Medical College of the very highest grade, and possessing, as they do, every facility, and the requisite determination for its accomplishment, the ultimate result may be predicted beyond any contingency.

That the efforts of the present corps of teachers have been received with general satisfaction, is evidenced by the gratifying compliment, conveyed in the rapidly augmenting numbers of each succeeding class in attendance upon the lectures here. Then permit me, in extending to you, gentlemen, our kindly greeting, this evening, to assure you, as I feel at full liberty to do in behalf of my colleagues, that if a predominant interest in your welfare and advancement, manifested by a sedulous discharge of our several duties, may be taken as a guarantee, the present course shall prove even more valuable than any preceding one.

This assurance is based not alone on the individual efforts of the Faculty, but also on the fact that the means of illustration and demonstration at their disposal are so ample, that every subject admitting of it will be presented in a demonstrative manner, or be fully illustrated—the advantages of which cannot be overestimated.

While I speak thus encouragingly of the institution of your choice, gentlemen, I cannot avoid congratulating you upon your selection of a profession. The medical profession is one with which you may well be satisfied. While it commands the respect of all classes of society by its utility, it challenges their confidence no less, by its certainty in securing the highest interests of those who become the recipients of its benefactions. It also exerts a most happy influence upon those devoted to the study of the *science*, or the practice of the *art*, by its tendency to strengthen the mind, refine the affections and

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elevate the character. It is a mistake to suppose, as many do, that the practice of Medicine, or of *Surgery* even, is calculated to harden the heart, and close the avenues to the kindlier sensibilities of our better nature, for whose words, if not those of the physician, can

"Dart hope into the soul
And cause comfort to dawn upon the distressed."

There should be higher and nobler motives to stimulate the medical student to assiduous application in the acquisition of his profession, or the physician to the prompt discharge of his arduous duties, than the mere hope of pecuniary reward, or considerations of social position which the profession promises to confer. Though the first of these may be amply secured, by observing the same rules which ensure it in other departments of human enterprise, viz: by industry, economy and perseverance: and the latter may be as surely attained by the recognition and an honorable observance of the laws of society.

Still these, desirable as they may appear, and even necessary as they are conceded to be, are equalled, if not excelled, by the gratification to be derived from the mental culture which the study of medicine requires, and the pleasurable emotions which follow the conscientious and skillful discharge of the duties of the physician. It is doubtful whether any other vocation demands for its successful practice an amount or variety of knowledge equal to that required for the skillful practice of medicine. In medical knowledge all sciences are represented. There is no branch of learning but may be advantageously applied in the elucidation of some medical principle, or lead to some valuable indication in practice.

The diversity of study has the pleasing effect of keeping the perceptive faculties active, and also of fixing the attention, both essential to progress in every branch of study; while the extent of the field is illimitable, and may engage all the powers of the most gifted and industrious. Thus the pleasure and interest are ever increasing; from the time when the tyro receives his first simple lesson, on through the entire

course of his pupilage; nor is the climax reached till the active duties of our noble profession are laid aside at the natural close of life, for, if well employed, the principles which guide the physician are

"The wings wherewith we fly to Heaven."

Should any infer from what I have said, that the pleasures of the physician are unalloyed, and to be enjoyed in listless ease, or exemption from labor and every annoyance, let such be at once undeceived, for I assure you that the life of the physician is one of constant toil, and attended by constant anxiety, from a consciousness of the fearful responsibility assumed. The life of the patient, and his own reputation are depending, and where the event is fatal; by the malignant whispers of malice or envy, he need not be surprised should he occasionally meet with undeserved censure and the most illiberal treatment, especially among the ignorant classes, who, being swayed by prejudice and vulgar errors, judge without reason and condem without mercy. The tongue of slander is as much at liberty as the tongue of truth, nor is it in his power to prevent the former from proclaiming its injurious falsehoods. Since you will hereafter be liable to receive your share of this detraction while in the discharge of the duties which will devolve on you as members of the profession, I may be allowed in passing to give you a general recipe, which will surely antidote all such ills, it is short, and is this: ever act in such a manner as not to deserve it, and the consciousness of having done your duty, will afford you a consolation which nothing can take away.

While some whom I now address, are known to have made considerable progress in the acquisition of medical knowledge and are familiar with the routine of college life; it is reasonable to presume that there are others present on this occasion, who occupy seats in the lecture room as a constituent portion of a medical class, for the first time. With the feelings and emotions of such, I can most fully sympathize. It may be,

you feel the diffidence which results from inexperience in the great world, or the loneliness which follows the separation from friends—and the confusion of being surrounded by new and stranger scenes, while you entertain but an imperfect idea of the amount of labor to be performed, or the obstacles to be overcome in the acquisition of the profession, and which profession, you may apprehend, may at last disappoint your hopes, either from your own wants of adaptability for its practice, or for anything which you can affirm to the contrary, by its own inherent elements of uncertainty. All these combined, if allowed an undue influence, will bear so heavily upon the spirit, as to seriously retard your progress toward the goal of ambition. These considerations have suggested to me the propriety of offering some thoughts upon the *certainty* and *utility* of medicine, as a science and an art.

This subject, I am sure, will not be devoid of interest to you, and I deem it a point of the first importance, that all doubt relative to the certainty of medicine should be removed from the minds of those pursuing the study or engaged in the practice of the profession; otherwise success will be at best but problematical. A sincere and true philosophy pervades the words of Cabanis, and they convey a deep sense, which forms the basis of all medical investigation and successful practice, says this philosopher: "In order to study and practice medicine in a proper manner, it is necessary to be impressed with its importance, and to be so impressed we must believe in it." This proposition is so manifest to the reflecting mind as hardly to require elucidation or argument to ensure its general acceptation. The successful cultivation of any department of science, requires on the part of the individual the power to control and fix the attention. The paramount importance of such ability and the disposition to exercise it, must be manifest in the study of medicine which comprises the sum of all sciences. Is it not quite certain that without this faith in medicine, the mind of the student would incline to inactivity and listlessness, and the attention would

become so easily diverted, by the thousand distracting influences which always surround him, that but very unsatisfactory progress will be made. This state of mind is equivalent to indifference, and indifference is fatal to true advancement, either in the study or practice of medicine. It will lead to the most serious consequences, in the exercise of the art, by the liability of adopting inefficient or inappropriate means for the removal of disease.

In this, we find the source of much of the odium cast upon the profession, and it is, at least one of the causes of the skepticism, in regard to the certainty of medicine which undeniably prevails to some extent in the public mind. To relieve himself from censure, the unskillful practitioner is ever ready to charge his want of success to the imperfections of medical science. The inconsistency of attributing the failings which result from the incapacity of the individual, to defects of the system needs but be stated to be appreciated.

To assume that the science of medicine is now absolutely perfect, and that every part thereof admits of actual demonstration, would be to argue the impossibility of improvement. While we freely admit the imperfections of the system, we at the same time feel a just pride in affirming, that in no other profession is such rapid progress making towards perfection as in ours. That no class of men are more zealous, nor have they been more successful, in the cultivation of general science, at the same time that they have been engaged in the advancement of their own particular calling, than the members of the medical profession.

It is believed by some that the diversity of opinion which prevails among physicians upon medical topics, theoretical and practical, is an unanswerable argument against the certainty of medicine. But admit this to be valid; and it would be easy to show, that the same charge will hold against almost every other vocation. Do we find a greater unanimity of opinion to prevail among the members of other professions than in our own? It would be interesting in this connection

to review some of the peculiarities of the principles and practice of the various vocations, recognized in civilized society, from which we may learn that diversity of opinion is not peculiar to medicine. From the want of time, however, a hasty glance must satisfy, our object not being to cavil at others.

We might naturally suppose that in *Theology* we should find the prevalence of the most perfect harmony of opinion, both upon the great doctrines of Christian faith, and of practice, based as they are upon the word of Inspiration, which is eternal verity, and unchangeable, and so plain, that he who runs may read. And yet, can there be anything more diverse, than the opinions entertained, and drawn from the Holy Scriptures, by those who make the Bible their constant study, and this too, not alone on points of speculation or of inference, but upon what would seem to be the plainest and most positive teaching of the Divine Code.

Or turn we to that other learned profession, the *Law*, which is claimed to be the perfection of human reason, and if it be asserted that the deductions in medicine be in any particular uncertain, what may we not say of those peculiar to the law. Its doctrines are written—its decisions voluminous —and every instinct of man would lead to a just decision, for the whole science is but a question of right and wrong. Here then should we not reasonably expect a concurrence of opinion —an agreement in conclusion, and especially so, as time is taken for mature consideration; and yet the contrary is of such frequent occurrence that the uncertainty of the law has passed into a proverb, which has been sarcastically and pertinently hit by Swift, as follows:

> "Demur, imparlance and essoign
> The parties ne'er could issue join;
> For sixteen years the cause was spun,
> And then stood, where it first begun."

In political economy the same still holds true. Do our statesmen agree in their opinions of manufactures, of banks, of currency, of tariff, or indeed upon any of the great questions of public policy? These instances are sufficient to show,

that diversity of opinion is not peculiar to our art, nor does our profession suffer by comparison with others. Navigation so far as it depends upon mathematics, is demonstrative, for by its rules the navigator is at any moment enabled to determine his exact location and the rate of progress. But when a prediction of the duration of the voyage is required, all becomes uncertainty, for a knowledge of the future prevalence of adverse winds is not revealed by his art. And during the prevalence of the tempest,

> "When gathering clouds like meeting armies
> Come on apace,"

And dash the billows in fury high above the prow, threatening destruction to sail and stay, and spar, not only is the successful termination of the voyage, but the safety of the bark itself, as much a problem as when the skill of the physician is tested in guiding the frail bark of life, through the struggling elements of disease which threaten its destruction.

Of the utility conferred by the medical profession upon individuals, upon society and the State, much might be said. These benefits, however, must be estimated by a different standard from that which rules in the ordinary business transactions of life. In these we may approximate if we do not reach with unerring exactness the results of labor. But the utility of the medical profession *cannot* be demonstrated by any pecuniary valuation; it reaches beyond and above all this, and must ever do so, while man remains subject to the same impulses and is actuated by the same motives which now and ever have governed him. The enjoyment of health and the desire for longevity are objects of the most intense interest to all, and only when these can be measured can we fully estimate the value of our profession, for, to secure these, the principles of our art are in constant requisition.

There have been those to question the utility of *science* in medicine, and insist that instinct, unaided by rules, is the best guide, in all cases involving either the health or the life of the individual. To illustrate the absurdity of such an assump-

tion, we need only refer to a few of the ordinary contingencies of ordinary experience. The traveller, under the scorching rays of the meridian sun—way-worn and weary—and parching with thirst, upon reaching the limpid stream that flows from the cool retreat of the mountain recess, would, by the promptings of nature, without delay slake his insatiable thirst, heedless of the danger he would incur. In case of luxation, actuated by the promptings of nature alone, every surgeon knows how strenuously, on account of the pain, the individual would resist the least attempt at motion, though this offers the only means of permanent relief, by the restoration of the joint. Or take another instance: in post partum hæmorrhage, where sudden death is inevitable, except the means of relief be directed by the rules of medical art; or in certain preternatural presentations where two individuals would certainly perish, where it not for well directed efforts to correct the errors of nature, and we surely have sufficient to indicate how futile is the assumption that the principles of medical science are valueless.

You will perceive that the exercise of these principles of medicine, in the prevention or the removal of disease, is something more than a mere trade; for while some of the causes of disease are physical in their nature, and tangible, whose effects may be anticipated, affording us opportunity to neutralize them; others are imponderable, and are everywhere prevalent in nature around us, the perturbations of which in the system are varied almost to infinity. These effects are all the more subtle, as they are manifested in the organized living and ever-changing structures of the body, which are so delicate and inimitable in their arrangement, as to impress the mind most profoundly with awe and admiration. The means to be relied on for the removal of these effects in the system must be regulated by the laws which regulate the sentient-vital principle—which govern the mental manifestations and control the physical forces of the system. The skillful physician must comprehend most perfectly the nature of these laws,

and their influence in health and in disease; he must be intimately acquainted with the structure and arrangement of all the organs of the body, so that ike the accomplished musical artist, who, familiar with the office and relative value of every key and chord in the complex structure of his favorite instrument, promptly detects the discord which results from derangements in any part, however slight or seemingly unimportant, and by timely aid restores the normal condition, and thus replaces the discord by the concord of sweetest harmony.

The question, then of paramount importance recurs, what estimate should be placed on the medical profession, and why should it command public confidence? These questions, perhaps, may be best answered by taking a brief retrospect of the profession. That faith is reposed in the efficacy of medicine, is incontrovertible; for, however much individuals may cavil at the profession, while in health, it is their first resort when beset by disease in any of its thousand forms. And what is true of the rofession in this respect at the present time, has been true of it ever since medicine was first cultivated as a science. And that this general conviction in the public mind is well founded, is most fully attested by the records of the past. While history is sometimes our best teacher, it may also be appealed to in support of the right, with the utmost confidence, as its testimony bears the impress of unerring certainty, and by its light, likewise, we are enabled to cast our vision back through the long lapse of centuries, till we observe the origin of our noble science in the early morning of the existence of the race. By such a view we shall be impressed with the fact that medicine did not suddenly reach its present degree of perfection, but gradually, by slow and many times unsteady step, as an illustration taken from early practice will show. The people of high antiquity, exposed the sick in public, so that any who passed, that had been similarly attacked and cured, might give advice for the benefit of the sufferer. And at a later period,

this plan was much better calculated to accelerate the progress of the art, for all who were cured of disease, were required to go and make an inscription in the temples, of the symptoms of their disease, and the curative agents which had been beneficial to them, and these registers were kept with the same care as the archives of the nation, and every person had the privilege of going to consult them, and of choosing for his sickness or that of his neighbor, the medicaments of which experience had confirmed the value.

Medicine in this early time occupied a very different position from that accorded to the profession now. Then its influence and efficacy were limited in amount and circumscribed in extent, and as the feeble rays from the glimmering taper seem fitful and uncertain; so in this primitive time was the practice of the healing art. But its office has ever been to cheer and to bless, though feebly and indifferently at first, yet from that time to the present its progress has been steadily onward and upward, till every portion of the civilized world has now become the recipient of its blessings, for, like the glorious luminary at meridian, it dispenses its genial influence upon all.

Medicine relates to nature, its defense and preservation, and no power that man possesses can surpass it in ameliorating the physical condion of the race. The most casual observation is sufficient for the confirmation of this truth, for individual cases cannot be wanting to any, in which they may have seen the efficacy of medicine demonstrated, and which leave on the mind no doubt of its potency. The same thing which you have thus witnessed in your individual observation has been many times repeated in society generally, so that we are enabled to affirm that through the direct influence of the science of medicine, the aggregate duration of human life has been greatly prolonged, even during the last half century. But upon this point, which is one of such inherent importance and so pertinent to the object before us, I will not limit myself to generalities, or mere assertion, but descend to the testimony of figures. In the broad field of vital statistics, we may find

incontestible evidence of the verity of our position, and also that by the same influence the duration and the suffering from disease has been greatly abbreviated and alleviated.

The reports of the Parisian Hospitals show, that while, in 1858, one died in seven who were admitted, now only one dies in twelve; thus demonstrating that our science has increased in its ability to save life, in the same order of diseases, and in the same buildings, about seventy-five per cent. in little over half a century.

In other words, in the Paris hospitals, where formerly fourteen men died of each hundred admitted, now only eight die, a saving of six persons in a hundred, and in the eighty thousand who annually pass through these wards, a saving of five hundred human beings. From the same source we learn that the period of their stay is greatly lessened; the average time of the residence in these institutions was formerly about thirty-nine days, now it is about twenty-four, making a difference that amounts to a very large per centage since 1805.

A corresponding improvement in the treatment of certain special specific diseases, during the same time, is also demonstrated. While in 1805 one patient died in every fifty-six subjected to treatment, now only one case in two hundred and ninety-four proves fatal.

In England, according to Macaulay, the term of human life has been greatly lengthened in the whole Kingdom. In 1685, not a sickly year, one in twenty of the inhabitants died, while at present, in London, only about one in forty dies.

In surgical practice, the saving of life at present exceeds by more than thirty-five per cent. the results at the begining of the present century. The returns of the Registrar General of England show a steady and notable decrease in the rate of mortality. In Renouard's History of Medicine, we read that in France, according to Dapin, the duration of human life has been increasing equal to fifty-two days for each year, from 1776 to 1842, or nine and a half years for the whole period.

The increase per annum was at no period less than nineteen

days, although that revolutionary and warlike nation shed seas of blood, not only in her cities, but upon every battle field of Europe.

In obstetric practice, one hundred and fifty years ago, according to Dr. Merriman, *one patient in every forty died.* At the close of his table, in 1828, only one in one hundred and seven died, and at the present time, probably not one in two hundred and fifty.

The improvement in the management of the diseases of infancy is still more conspicuous. M. Quitelet, in his very learned table, states that, in Belgium, of infants born alive, one tenth died within a month, and by the fifth year nearly one half the number of children had died. In Prussia, during the interval from 1820 to 1828, the deaths in the first year were in the ratio of over 26,000 to 100,000. In France, in 1802, it amounted to over 21,000; in Amsterdam, over 22,000, from 1818 to 1829; in Sweden, to over 22,000, from 1821 to 1825. From the Registrar General's report of England, it appears that more than one third of the total deaths in England and Wales occur under one year of age. In Mr. McLean's visit to St. Kilder, he states that eight out of every ten children die between the eighth and twelfth days of their existence. Dr. Combe states that about a century ago, the workhouses of London presented the astounding result of twenty-three deaths in every twenty-four infants under the age of one year; but by improved management, the proportion of deaths was speedily reduced from 2,600 to 450 a year.

One more illustration taken from Dr. Willan's tables, shows the following results:

From 1749 to 1758—1 in 15 children died.
" 1759 to 1768—1 in 20 " "
" 1769 to 1778—1 in 42 " "
" 1779 to 1788—1 in 44 " "
" 1789 to 1798—1 in 77* " "

Much more might be cited to prove, that important and

* Churchill, on Children.

rapid advances have been made in the treatment of infantile diseases, but sufficient has been advanced for our present purpose. By this view of the subject, we are forced to dissent from the sentiment of Spenser, and can only excuse it by granting him a poet's license, when he asserts that,

"The term of life is limited,
Nor may a man prolong or shorten it."

By comparing the hospital reports from the different parts of this country, the same results will be obtained as those derived from corresponding institutions in Europe.

Now, from these various sources, we demonstrate that the duration of human life, through the direct agency of our profession, has been prolonged within the last seventy-five years more than thirty per cent. Should it be urged that the cessation of warlike hostilities, and the general improvement in the condition of the masses, will account for this gain, we have but to compare the reports of hospitals seventy-five years ago, with the reports from the same institutions now, and as these are the peculiar battle fields of the physician, they may with propriety be taken as the indices of what has been done for society at large.

How eloquent are figures in support of the position I have taken! How demonstrative of the utility of our beneficent profession to the best interests of man! It is sometimes interesting thus to take, as it were, a birds-eye view of the profession, as it has made its advances, through the ages past, and note the many triumphs which it has achieved in reaching its present exalted position, and we might, had we time, individualize the persons who have done so much for its perfection and usefulness. Is it probable that a profession which has accomplished so much, and made with rapid strides such a near approach to perfection, is henceforth to stand still, content with what the past has done; or, even as those who put their trust in "pellets" would have us believe, be forced to recede from its present advanced position, loose its hold upon the confidence of an appreciative public, and be lost in forgetfulness? With all this volume and weight of evidence of

the utility of medical science, to the State, to society and to individuals, which are accessible to all, and even much more than I have cited, there are those who express a want of confidence in medicine as taught and practiced by the profession at the present day, but affect a faith in the baseless pretensions of one or other of those excrescences of society, who, attached to some of the irregular and exclusive systems, swarm around, like the flies in the fable, merely to "*bleed*" the victim on whom they may chance to alight, while caught in the branches of credulity. But neither these systems of quackery nor their adherents, or their assumptions, are peculiar to our time. There has never been a period in the history of medicine when there was not one or more opposing sects and exclusive systems, which, by clamoring against the profession, hoped to foist themselves into popular favor; but the history of all such shows how miserably they have failed of ultimate success. Not one of them all, though their name be legion, has endured the ordeal forced upon them by the test of time. Nor was it in the nature of things that they should, for being founded on baseless assumption, it was inevitable that they must succumb to the overwhelming power of *experiment*, *induction* and *demonstration*. *These* constitute the Ithureal spear, at the touch of which they

> "Return
> Of force to their own likeness,
> * * * * * * *
> And start up in their own fiendish shape."

These form the Herculean Club that ever has, and must continue to strike off the heads of this hydra monster; *these* constitute the rock that is to bury them successively forever from sight.

That alone is enduring in our profession which is founded upon this rock, *experiment*, induction and *demonstration*. All else, however specious its pretensions, must as inevitably disappear, as the dew before the morning sun. From this stand point, we may safely and confidently predict the fate of the

those systems and theories which at the present time endeavor to direct attention from scientific medicine. Is not the history of "*Similia*" and "*infininitesimal dilutions*" already well nigh written? For, what is the practice of the sect to-day? Do they hold to a single cardinal principle of their founder? Let the practice of their leaders answer; they administer the remedy that *experience* has found most efficient, and in doses to produce *sensible* effects. Thus we see there is absolutely nothing left of this system but its name. And why should it not be with this, as with every other assumption which is utterly devoid of sense or reason? If an individual were to claim that he had the power of healing a wound made by a cutlass by extending it with a saber, would you think he could induce followers to exercise faith in his pretensions? Perhaps not; and still there are not wanting those whose opinions upon medicine are quite as absurd as this would be. I am sure I know of no way to account for such a perversion of common sense except it be that their minds are so constituted, that the more you dilute the sense, the stronger to them you make the argument.

You may apply still another test to any or all of the exclusive systems which have been set up in opposition to medicine. While their adherents attempt to cast odium upon the profession, by flippantly asserting that *they* are of the progressive school, while the old school remains where its founders left it, you will ask in vain to have them point out any, even the least real improvement in medicine contributed by their adherents, or that has been introduced as the result of their system. What new fact in Anatomy? what in Physiology or Pathology is indebted to them for its birth and usefulness? What new principle in Therapeutics, or what valuable article of the Materia Medica has been added to the sum of human knowledge, by any of the exclusive systems of the present or past time? I am sustained by the record, when I affirm that nothing absolutely of value has been contributed by any of these pseudo reformers.

Gentlemen, I will not pursue this line of thought further. I am sure you already appreciate, at least in some degree, the importance of the subject, and the extent of attainments which a knowledge of *medical science* requires. If you have a just appreciation either of the extent or variety of learning necessary to constitute you skillful physicians, you cannot fail to perceive that this is to be acquired only by laborious and persevering application. For this purpose you are here, and it is hoped, for the single purpose of preparing yourselves for the discharge of most important and responsible duties. It will be our pleasure, as well as duty, to aid you in so doing. If we may but initiate you into the mysteries of our profession, it is all that we can reasonably hope. We need not attempt to teach you all that you are to learn, for the goal indicating the end of improvement in our profession is not yet in view. This fact should, nay, will stimulate you to extend your explorations, even beyond the regions already surveyed and maped out to guide you in starting. Ever remember that opportunities for the brightest achievements are still before you.

You already infer that I would not have you lapse into a state of listless ease and indifference, vainly hoping that when the period has passed in which we are to meet within these halls consecrated to science, and you have taken your departure and are engaged in the active duties of your calling, that then the needed knowledge will come to you as by intuition. I admonish you now, as I should warn you early, that you may *thus* occupy those seats, till you become transformed into fixtures, and you will still be as far from the attainment of your hopes as ever.

It is related of Mercury, that in exchange for the Lyre, he received from Apollo the "*Caduceus*," the insignia of his power and success. This was a staff, one end of which was ornamented with two wings, and around it two serpents were entwined in graceful coils. The wings were indicative of *diligence*, and the serpents of *prudence*—two characteristics

long ago deemed essential to success in every undertaking, and the experience of ages, has fully confirmed the truth of this principle so beautifully illustrated in classic mythology of the ancients.

To you, young gentlemen, just setting out in the attainment of your profession, I know of no more important characteristic than *diligence*, and especially so would you attain an honorable position in the noble profession which you have chosen. If you have undertaken the study of medicine under a deep and abiding appreciation of its responsibilities, and the indispensible necessity of unremitting *diligence* in its pursuit, which I have a right to assume from your presence on this occasion, then I would bid you a hearty God speed in the attainment of your most lofty aspirations.

I feel confident you have resolved, without the least mental reservation, that your industry and application during the current session, shall be commensurate with the imperative demands upon you as medical students. That though the road which you are to travel may lead up the steep ascent, and seem beset with apparently insurmountable obstacles, yet that you will boldly, advance. Then let me say, that if you approach the task with a *determined will* and with *diligence*, the obstacles are only apparent, and your ascent will be more and still more easy, as you advance, till what at first seemed tedious and dispiriting, will give you the keenest pleasure, as you hear

"A voice replying far up the hight,
Excelsior!"

Our position demands that we instruct you not only in the principles of our science, but also what may be essential to some present: that we teach you how to learn. To acquire a knowledge of the principles of medicine while in attendance upon the course of instruction to be given here, which, as in the acquisition of knowledge generally, will require the co-ordination of all the faculties of the mind, and the active and vigilant exercise of all; and not only this, but the co-operation

of a healthy body; for if the body be not intact, the mind, from a physical necessity, can neither make the desired or the normal progress, any more than a defective instrument can yield the strains of harmony.

The proper training and exercise of the intellectual faculties hold a place of first importance in your course of education. Observation must be cultivated, perception quickened, memory strengthened, and reflection must be ever active. How can all this be effected? Can it be best accomplished by the practice so universal among medical students, of taking notes of the lectures, during their delivery? These are questions which claim your careful consideration, now, at the opening of the course. Were I to answer from my own experience, or from the observations which I have made upon this particular point, to the latter question, I should unhesitatingly say, no. There are comparatively very few of those who compose the classes in the various Medical Colleges in the country, who can commit the teaching of the lecture to paper with such facility as to omit nothing of real importance. This is of itself an art, that only the few possess who make it the business of their lives. Without disparagement, I think I can state, as the rule, that only disconnected sentences are written down in the lecture room, and these not always the most important. And while this has been thus imperfectly performed, much of the lecture that was of importance to be remembered, is lost beyond recovery; so that at the conclu sion of the hour, but little more than a vague and confused impression of the lecture is left on the mind; and should the student refer to the notes to correct errors or fill up the hiatus, they will be found entirely inadequate, or if a resort be made to the *Text Book* for the purpose, the entire subject must be read, and the lecture, so far as the individual is concerned, need not have been given. But such an amount of reading during the progress of the lectures, is manifestly impracticable. The use of the text book should be limited to recalling the fact or principle inculcated in the lecture, which may acciden-

tally have passed from even a well regulated mind. Is it not clear then that the mode usually followed, of taking notes in the lecture room, is not, in every case at least, calculated to improve the intellectual faculties, or leave a lasting and distinct impression of the subject upon the mind.

I would not have you infer from this, that I disapprove of taking notes of the lectures. The practice, however, which I would recommend to you as worthy a thorough trial, is this: After having given your individual attention to the several lectures of the day, and you have reached your rooms, in the evening, commence with the first lecture given in the morning, and write from memory as much of it as you can; then do the same with the second, and of all the lectures given during the day. Although your first efforts may not be perfectly satisfactory to yourselves, yet, by industry and perseverance, your improvement will be such, that you will, yourselves, be surprised at the progress. I have known those who could thus reproduce the lecture almost entire. When you can do this you will have made the knowledge contained in it your own for all time.

Before passing I wish to impress upon your minds what I conceive to be indispensable, viz: the habit of controlling and *fixing the attention.*

There are good reasons for the opinion that this ability to *fix the attention*, is a principal cause of the difference in the intellectual manifestations of different individuals as we meet them in society. We are in the habit of attributing the cause of such difference to original conformation and natural endowment. While this relieves the individual from much of the responsibility of non-improvement, we still insist that intellectual improvement is to a great extent under the immediate control of the individual, by his voluntary efforts in directing the faculties and fixing the attention. This should be so complete that for the time, by abstraction, to become oblivious to all that would divert the mind or distract the powers of reflection. Except this power be cultivated so as to become habit-

ual, you will subsequently learn, to your great regret, that your time has been well nigh misspent; and that while you have supposed you were making some progress in your studies, you will find that you are but a little way removed from the point whence you set out. For the impressions which are made upon the mind, while in a listless or distracted state are never lasting; they cannot be enduring, but must be as evanescent as

> "The snow-drop in the river,
> A moment white, then fades forever."

This is the result of a physical necessity, depending upon the peculiarity of human organization. The registering gangha of the brain require that every impression made upon them, be continued for a definite period of time, so that the image may become daguerreotyped there; may be limned by the pencil of the spirit; that memory, aided by this picture, may recall the idea in after time, for use in the active duties of life.

If *diligence* is of the first importance to you as medical students, so is *prudence* essential to ensure your success, not only as physicians, but to you while on the threshold of the profession. Every circumstance which may have any influence upon your individuality either as students or physicians, or as men, claims your most serious consideration, and no circumstance of your lives is to be regarded as of trifling moment, though it have but a seemingly slight influence in giving a bias to your thoughts, or irregularity to your habits. For although it may appear to be slight in itself at the present moment, it may by no means be trifling in its consequences. You are to remember that the human mind is ever plastic, and never more so than in the spring time of life, when it is ready to take any form or move in any direction, which the circumstances of accident or fortune may impress upon it.

Like the waters of the lake, whose mirrored surface is so easily thrown into agitation, that even the dropping of a pebble into its glassy bosom, unsettles its quiet surface; though

limited at first, yet the agitation, in widening circles, extends until it is lost in the distance.

So is it with impressions made upon the mind. They may be so slight as well nigh to pass unheeded, but they are ever gaining strength and extending their influence. Therefore I charge you guard most zealously against the admission of all influences, whose *tendency* would be to lead the mind from the practice of industry and the path of virtue and honor. Never for a moment lose sight of your own manliness. You would do well to adopt the sentiment of the poet as your own:

> "We live in deeds, not years—in thoughts, not breaths—
> In feelings, not in figures on a dial;
> We should count time by heart-throbs. He most lives
> Who thinks most—feels the noblest—acts the best."

After what I said, I certainly can have little need to admonish you to guard especially against every inclination, to give loose reins to habits of dissipation or any other vice, the indulgence of which would enervate the intellectual powers, and retard the improvement of the mind. I will not then detain you longer; but, in closing, allow me to reaffirm, that excellence is never granted to man, but as the reward of labor. It argues, indeed, no small strength of mind to persevere in habits of industry, without the pleasure of perceiving those advances, which, like the hands of a clock while they make hourly approaches to their point, yet proceed so slowly as to escape observation. Need I then re-enforce the necessity of continued application. You must have no dependence on your own genius. If you have great talents, industry will improve them. If you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well directed labor—nothing is to be obtained without it.

CASES OF PLACENTA PRÆVIA.

By JONATHAN W. BROOKS, M. D., of Chicago, Ills.

The following monograph of five cases of Placenta Prævia, which have occurred under the writer's observation during the last twenty-five years, will perhaps go directly to confirm an opinion expressed by some eminent practitioners, to wit: that the placenta should be entirely separated from the uterus, as early as possible after labor commences, attended by hæmorrhage arising from this peculiar point of attachment; for this important reason, that the hæmorrhage is thereby promptly arrested, and the risks both to mother and child materially lessened.

Case 1st—Was called to L——a M——n, of N—— H——, prima para, unmarried, May 7th, 1836, at 5 o'clock A. M. The following is her own brief and sorrowful history, as narrated to me by Mrs. B., with whom she boarded, her own sister and another relative: An orphan, aged 17 years and 4 months, unmarried; enciente, by her sister's husband. Was drugged constantly for seven months after the interruption of her catamenia, which, from her statement, occurred early in August, 1835. Had never known a sick day until about the tenth of Sept., same year, when she took essential oil of savin in twenty drop doses, three times per diem, for five consecutive days; said it purged and vomited her dreadfully and made her have some show, yet did not remove her burthen, but left a tenderness all over the stomach. From that time to early in April, 1836, she took nostrums and drugs, always being poorly. About April 6th she had some intimations of approaching labor, by cutting pains, &c., accompanied by hæmorrhage; at which time she had a midwife in attendance.

Toward the close of April she was removed from N—— H——, to near my residence for the purpose of concealment. She was then placed in charge of a professed midwife—a stranger to all parties; who, with those in attendance, reported labor as having commenced about four hours previous to my arrival and flooding about two hours. They were not alarmed until half-past four o'clock, when a severe and protracted pain was accompanied by copious flooding and alarming prostration. At 5 o'clock A. M., the following aspect presented itself: The bed and bedding were drenched in blood; the patient restless, her countenance pale and anxious; pulse one hundred and fifteen, quick, and her extremities cold. Examination per vaginam, os uteri very tender, dilatable to some extent, but not well relaxed; placenta placed directly over it; about one-third of that portion towards the left acetabulum of the patient was detached from the uterus, whence was issuing the blood. The membranes were evidently unbroken. It was my first case of the kind.

The danger being imminent, proceeded instantly to detach the residue of the placenta with the index finger of the right hand, which being accomplished, the hæmorrhage ceased, and within six minutes a very heavy, strong pain expelled the placenta, the liquor amnii, and brought the child near the vulva. A second pain followed almost without interval, expelling a well developed boy weighing nine pounds, feeble yet viable. No blood was believed to have been lost after the separation of the placenta. The uterus contracted feebly. The child was handed to an attendant, placenta and all, and afterwards attended to; and was a fine healthy man in May, 1861. A bandage was applied* (of the pattern still preferred

* The bandage consists of a body and four straps, all made double of heavy new muslin, that has been thoroughly softened by washing. Length of body thirty-six inches, width of ends nine inches; the centre should be four inches wider, and that part nine inches between the corners. The point between the widest and narrowest part of the body should form an arc. Two straps, twenty inches long, to pass around the body, five and a half inches wide where they attach to the middle of the body and four and a half inches at the other end. Five inches from the left end of the body should be a perpendicular opening to

by me) as speedily as possible to the mother. There was jactitation and constant throwing of her arms and hands, a blanched and still more anxious countenance, pulse one hundred and fifty with intermissions, faintness. Gave Tinct Opii thirty drops, brandy, as much as she could swallow. In thirty minutes repeated the Tinct Opii. In forty minutes, no rallying; gave Tinct. Opii fifteen drops, Spts. Camphor twenty-five drops. In ten minutes more gave six grains Carbonate of Ammonia in a solution of Gum Arabic; applied dry warmth to extremities, &c. But all to no purpose. She continued to sink, and died from exhaustion in about two hours from the birth of the child.

Leave being obtained, an autopsy was had thirty hours after death. External aspect, complexion fair, surface peculiarly white. An indentation on the right parietal bone, a little below the protubuance, said by her friends to have been produced by a fall during a convulsion, which was supposed to be caused by some drug she had taken. On the right side of the abdomen, on a line with the umbilicus, was the appearance of a bruise, dating back some time, and believed by her friends to have occurred at the same time as the indentation of skull. Body very plump; rigor mortis rather slight. On opening the abdomen the intestines and omentum were found agglutinated to each other by inflammatory lymph on exudation. Opposite the bruised point the exudation was more striking. Some blood in the vessels. Portions of the peritonum gave evidence of inflammatory action. Uterus well contracted, more pale than usual; indubitable evidence of the exact attachment of the placenta over the os uteri. The other visceræ of the abdomen in a generally healthy condition, as well as those of the chest. Under the indentation of the cranium was a small extravasation of blood apparently in

receive the right strap, which prevents slipping. These straps fasten in front. Two straps, eighteen inches long, one and a half wide, one end of each attached to the body of the bandage, eight inches from each end, and the other ends fastened to the corners of the widest part of the bandage. These embrace the thighs and keep the lower part in situ.

process of removal by absorption; otherwise the contents of the cranium appeared healthy, but pale.

This was a case where ecbolics had been used, so for as we may credit the testimony of others, to a greater extent than has ever fallen under the writer's observation, and, in his opinion, contributed largely to the fatal result.

Case 2nd—E—— M——r, married, has had syphilis and miscarried from the third to the fifth month four times previous to Jan., 1844. Was called to her January 4th, 1745, at 1 o'clock P. M. Examination per vaginam elicited the following condition: Blood oozing freely from os uteri, some tenderness of same.

On interrogation, says she was washing, and while at the tub something seemed to give way and she began to flow hard then, and it still continued, uneasiness and pain in the uterine region. Absolute rest in the recumbent posture, Tinct. Opii twenty drops in water, quiet to be observed. Two o'clock, uneasiness, abating hæmorrhage also. Tinct. Opii, fifteen drops in aqua. At half-past two she fell asleep and continued so for forty minutes; awoke refreshed, with hæmorrhage very slight. Gave ten drops of Tinct. Opii. She soon recovered.

Feb. 8th, 1845—Was summoned to her at 2 o'clock A. M. On arrival the following condition presented itself: Bedding and clothing very much saturated with blood. The patient did not seem exhausted. Reported herself as having had labor pains for two hours. At twenty minutes of two, she had a brisk pain, and flowed, she thinks, ten minutes; then, with another brisk pain, something seemed to come low down in the passage; since which she is confident she has lost no blood.

Examination.—Placenta at the vulva. In ten minutes it was expelled with some liquor amni.

Farther examination informed us that the fœtus was presenting by the feet. In eleven minutes it was expelled by natural efforts, and gave some equivocal signs of viability. The mother believed it to be an eight month's one, and

appearances would confirm that opinion. Its abdomen was dropsical. She made a good recovery, and in ten months gave birth to a son at eight months that lived five weeks.

Case 3rd—Was called in consultation in case of Mrs. E—C——h, May 24th, 1850, with Dr. T——, the attending physician, at 6 o'clock A. M. Believes herself about three months advanced in her sixth pregnancy. Is a pale, delicate woman, of fine intellectual endowments and culture. In her first labor had several convulsions. Complains of pain and weight lower in the maternal organs than she has ever experienced in previous instances. She has for several days had moderate hæmorrhage (passive), but kept up with her family, attending to her ordinary duties. Examination revealed closed os uteri and oozing of blood. Has some headache in the erect posture, with a blowing sound in her ears, which is somewhat relieved by reclining. Pulse ninety, quick and feeble. Heart easily excited to palpitation by noise; bowels relaxed, urine excessive in quantity and pale, feet a little swelled. Absolute rest in recumbent posture. Take Tinct. Opii fifteen drops.

℞ Quinine Sulph. iss ℈
Gum Opii Pulv. gr. ivss Mft. Mass.
Syrup Simp q. s. Pillulæ No. xii.

Give one every two hours. If hæmorrhage essentially abates or suspends, once in four hours, generous diet. At 7 P. M. saw her again, by request of her medical adviser. Hæmorrhage abating, free from headache; dined at 1 P. M., on mutton-chop, with roast potatoes and a cup of good Mocha coffee, and has felt better for it. Continue pills once in four hours.

25th, 10 A. M.—Met Dr. T. agreeably to appointment. She had scrupulously followed directions. Head clear, free from pain; has rested well through the night, which she has not done for some weeks previously. To use her expression, she has been fidgetty, wakeful and restless these six weeks past. Bowels moved naturally this morning; urine less in

quantity, more color; hæmorrhage inconsiderable; pulse eighty-four, more full and soft; heart's action less easily excited; less uneasiness in the maternal organs. Continue treatment and diet.

26th, 10 A. M.—Met again. The patient still farther improved; very little oozing of blood from os uteri. Expresses herself as feeling better than for two months. Continue pills once in six hours. Still keeping her bed. Suggested to my medical friend that it might be a case of Placenta Prævia.

27th—Still improving; hæmorrhage entirely ceased; continue diet; recline most of the time for several days.

℞ Quinine Sulph. i ʒ
Syrup Gum Arabic qs
M. Mass. Pillulae No. xx

Take one every eight hours. From this time her physician informs me, she progressed well, and took no more medicine after exhausting the last prescription, and did not see her again until summoned to meet her medical attendant in consultation, Sept. 25th, at 1 P. M., serious hæmorrhage having supervened, as she thought, by lifting too much an hour previous. On arrival, found her much as on May 24th, except the hæmorrhage was more active and she restless, with frequent sighings; nausea; no vomiting; pulse 110. Examination—Os uteri rigid; nothing like dilatation; tender to the touch; blood oozing freely; some cutting pain and aching in maternal organs; extremities cold; apply warm, dry flannels to them.

℞ Tinct. Opii xxv gtts
Spts. Camphor xx gtts
Sacch Saturni v grs
Aquae q s Hanstus.

Half-past two, slightly improved. Repeat draught. Four o'clock, repeat draught. Six, has slept quietly fifty minutes; hæmorrhage greatly abated; wishes food, and partakes of broiled steak and a cup of well dressed coffee, and enjoys them. Half-past eight, still better; repeat draught. Ten,

hæmorrhage slight; quiet; cutting pains absent; aching in maternal organs greatly relieved.

℞ Quinine Sulph. ii ℈
Gum Opii V grs
Syrup Gum Arabic qs
M. Mass. Pillulae No. xxv

To be taken one every five hours, commencing at 12 o'clock M.; generous diet.

26th—Better; hæmorrhage suspended; improved in every particular. Pills to be given once in eight hours, No. i. Continue diet and *rest absolute.*

27th—Convalescing. Suggest watchfulness as to hæmorrhage. Am confident it is a case of Placenta Prævia.

Oct. 20th—Called with my friend at 5 P. M. Examination—Some oozing of blood; os uteri rigid. Patient expresses herself, positively, that she thinks it was induced by walking more than usual, and slipping while walking. Is confident she has been better the last three weeks than at any time for the last three months preceding. Her appearance indicates all she expresses. Complains of some uneasiness in the maternal organs; not much tenderness of os uteri; eats well; sleeps well; pulse eighty, nearly natural for fulness and softness; nervousness slight; bowels in good state; urine, she thinks, is about as it is when she is in ordinary good health.

℞ Tinct. Opii x gtts
Aqua q s Haustus.

Repeat once in two hours, until hæmorrhage is arrested. Recumbent posture; quiet.

21st—Better; hæmorrhage entirely ceased; expresses herself as feeling as well as she did three days before she slipped. Suspend medicaments; continue reclining two or three days.

Nov. 22nd—At special request of my excellent friend, was summoned with him at 3 A. M. Examination, on arrival, elicited the fact that the external organs were relaxing; the os uteri was not dilated. There were irregular premonitory

pains. Says she feels well; is in good spirits. Her attending physician says he never saw her look better when labor was near. About five o'clock she had a smart labor pain. Examination disclosed the os relaxing and dilating some hæmorrhage; the edge of the placenta loose, presenting. The finger, passing by the loosened edge, came in contact with the membranes unbroken. From this time labor pains steadily increased, and the os relaxing till near seven o'clock, when a brisk pain was attended with a rapid flow of blood. Membranes yet unruptured; the placenta attached towards the right acetabulum of the mother rather anteriorly; blood continuing to flow. Suggested the immediate detaching of the placenta in its entirety, which was accomplished with some difficulty, by the index finger of the right hand; the membranes giving way at the same time, and the head advancing in the first natural position of Dewees. In less than five minutes the placenta was expelled, almost instantly being followed by a female child, weighing six and a half pounds. It moved a little spasmodically at first, gasping occasionally. Soon, by dashing small quantities of cold water on its face and on its chest, and using artificial aspiration by application of mouth to mouth, thus inflating, and then, with the hands, compressing the chest, respiration was fully established, and is now, 1861, a fine healthy girl. Very little blood was lost after the final separation of the placenta from uterus. The mother made an excellent recovery, and has since given birth to one son and three daughters, without complication.

Case 4th—Was called to Mrs. F——, May 22nd, 1856, whose history to that time is briefly this: Complexion, a brunette; married at eighteen years; has uniformly enjoyed good health to May 16th, and is enceinte for the fourth time. The first birth, thirteen months after marriage; the others at intervals of two years; the youngest now a little more than two years old. May 16th, 1856, she fell, injuring her back. Thinks herself about two months advanced in pregnancy.

Has uterine hæmorrhage, which commenced three days since. Reports having had something like her catamenia a month ago, much less in quantity and of a brighter color than natural; at the same time had the symptoms which invariably attend her during the first months of this state. Examination—Os uteri closed, more full and round than it is generally at the second month, perhaps fairly increased by one-fifth from normal condition; blood oozing from os uteri. Sensation through the loins, thighs and lower extremities, like those she is accustomed to at the month; bowels well opened; urine small in quantity; pulse eighty, a little full and tense; face slightly flushed. Diagnosed a case of Placenta Prævia. Venesection six ounces. Spts. Nit Dulcis thirty drops, once in two hours; absolute rest in recumbent posture, hard bed, care and quiet strictly enjoined; diet toast and black tea, the latter cool.

23rd—Hæmorrhage suspended. Expresses herself as feeling better decidedly every way. Enjoin rest and quiet with moderate diet for a few days, with injunction to notify me at the earliest possible moment if hæmorrhage returned, which directions were carefully observed.

June 21st, 10 o'clock A. M.—Called again. Patient has been well as usual since May 24th. At nine o'clock, when in the act of rising from her chair and walking across the room, hæmorrhage commenced more brisk than before. She reclined immediately, and sent a messenger to make this announcement. On arrival, instituted an examination.—Found more fullness than is common at this period of pregnancy of the os and cervix uteri; no dilatation; the oozing more brisk than a month ago; has some of the feelings attending the catamenial discharge, with sharp, cutting pains; pulse seventy, natural as to force and fulness. Continue rest in recumbent posture, light diet.

℞ Gum Opii ii grs
Sacch Saturni vi grs
Syrup Simp q s M.

Pillulae No. viii are to be taken every two hours till pains suspend; xx drops Spts. Nit. Dul. in water procenata.

22nd—Better; hæmorrhage and pain suspended about 5 P. M. Thinks she lost one and a half pints to one quart of blood, which was probably not far from the truth. Gave the same general directions and instructions as before.

Dec. 22nd—Was summoned at 9 o'clock P. M. Intimations of approaching labor by slight cutting pains; external parts relaxing, moist; no dilatation of the os uteri; no distinct labor pain. Seated by the bed-side of the patient, she reclining on her back, at 10 P. M., with the above condition, presenting in two minutes an intense pain, accompanied by copious flooding, announced labor rapidly progressing. Os uteri very dilutable; placenta presenting, entirely occluding the os membranes, not approachable by reason of it; liquor amuni not evacuated. Proceeded at once to detach the placenta fully. Within four minutes from the first pain, a most vigorous one came, during which the entire placenta was delivered, also a part of the waters discharged, and the head of the child was brought low down in a natural position. A third promptly followed, which completely delivered a small female child (weight five pounds) and the residue of the liquor amnii. The hæmorrhage ceased with the separation of the placenta. The child was pale—apparently dead. By persevering efforts of the usual means of resuscitation, in nine minutes it gave a spasmodic twitch of the left leg; in ten, a gasp; these were repeated, and in fifteen minutes respiration was fully established. The child was feeble and anæmic the first two years, and grew very little. Since then, had grown pretty well; is now, 1861, rather small for her years and robust. The mother made a good recovery, though somewhat enfeebled by the flooding, and has since given birth to a son without complication.

Case 5th—Dec. 29th, 1860, was called at 5 P. M., to C—— T——t, German, married; a stranger to me. Is apparently a very stout, healthy, well developed woman. Her fourth

pregnancy. Says she has not felt right any of the time (this is her expression) low down in her belly, and you will find I am not right, Dr. Examination—Parts relaxing well; capacious, above the average; os uteri not dilated. Labor progressed with rapidity. At five minutes before 6 P. M., found the os dilating rapidly, the peculiar feeling of the placenta communicated to the finger. Quick as thought came a most agonizing pain, attended by a great gush of blood. The placenta and liquor amnii following the latter in large quantity. Am confident there was no hæmorrhage of any amount subsequent to the expulsion of the placenta. The pain continued till a small male child was expelled. The woman made an excellent recovery. The child grew slowly for a time, but now, Oct., 1861, is fully an average for health and strength.

SELECTED.

SPINA BIFIDA, TREATED BY IODINE—CURE BY ONE INJECTION.

By DANIEL BRAINARD, M.D.,
Professor of Surgery in Rush Medical College, etc.

November 7th, 1860, a girl three years old was brought to me to be treated for spina bifida. The child was intelligent, healthy, and well formed in every respect excepting the tumor situated over the sacrum. This was eight inches in circumference at the base, about two and a half inches in height, conical, translucent, elastic, and covered with healthy skin excepting a small point at the lower part where it was discoloured like the vestige of a nævus. Below the tumor there was an umbilicated depression like a cicatrix adhering to the sacrum.

Operation.—Nov. 10th, 1860, assisted by Prof. Ephraim Ingalls and Dr. Edwin Powell, the operation was performed as follows: A small sized hydrocele trocar was carried into the tumour at its base on the right side, and six ounces of fluid drawn off; while this was flowing, pressure was made by an assistant, and as the sac was emptied, the pulp of the thumb was pressed upon and partly into the opening in the spine which it exactly filled, so as to close it as perfectly as possible. Half an ounce of a solution (five grains iodine, fifteen grain iodide potass to the ounce distilled water) at the temperature of the body, was then injected through the canula and after a few seconds allowed to flow out; distilled water at the temperature of the body was thrown in to wash out the iodine, and two ounces of the fluid first drawn from the sac and kept at the same temperature, were re-injected and the canula withdrawn. From movements of the child, some bubbles of air passed into the sac, and as these could not readily be brought out they were left.

During the operation the child was kept under the influence of chloroform, of which it required a very unusual quantity, and, when this was finished, it remained fifteen minutes in a quiet sleep.

The puncture was dressed with a strip of isinglass plaster and a compress supported by a band around the pelvis placed over it.

On awakening, the child made efforts to vomit and seemed to be severely nauseated for half an hour, when it fell into a light sleep. During the afternoon it vomited occasionally, refused food, asked for cold water, and urinated often.

11*th.* Has been restless during the night, probably from being kept lying on the face; pulse and heat of skin natural, puncture at eleven o'clock; twenty-four hours after the operation, found to be leaking; tumor tense; applied more perfect compression over it. During the day child drank freely of toast water, and in the afternoon fell into a free warm perspiration, which lasted two hours.

12*th.* Has slept well, asked for toasted bread twice, and ate it; seems perfectly well.

13*th.* Tumour tense, redness around the puncture; applied cloths dipped in warm water.

15*th.* Puncture leaking; passed a fine needle through the edges, tied a fine thread around it, in form of twisted suture.

17*th.* Tumour tense; tapped it on the left side near the base on sound skin with an exploring trocar, and drew off six ounces of slightly turbid fluid. Continued warm water applications.

19*th.* First puncture leaks slightly; needle withdrawn and compress supported by a truss placed over it.

20*th.* First puncture closed; child in its usual health, tumour flaccid, walls slightly firmer than before the operation. *Translucency quite gone.* Applied an India-rubber band around the pelvis so as to compress the sac.

25*th.* Tumour much diminished; walls firmer. Removed the band and substituted an umbilical truss, the pad of which was placed over the sac.

30*th.* Child in good health; tumour diminishing.

Dec. 3. Tumour but imperfectly fluctuating and evidently filled with semi-solid contents.

From this time to December 31st the truss was kept applied with compresses of fine linen within the centre, so as to press the skin into the opening in the spine. It was taken off and replaced daily, so as to avoid excoriation. The child suffered no pain, was in perfect health, and played about as before the operation.

31*st.* The skin at the centre of the tumour is adherent to the opening in the spine, which is felt to be closed. A little

fulness around the base at the upper part alone marks the vestige of the tumour. I advised the continued wearing of the truss unless it should excoriate, and the parents left for home.

Feb. 10. Child has remained well; no tendency to return in the tumour. Truss has been left off for several weeks at a time when the pressure produced restlessness.

The fluid first drawn from this tumour was perfectly limpid, had the peculiar odour of the cerebro-spinal fluid, was very slightly albuminous.

With the microscope, only a few epithelial scales, and a trace of coagulated fibrin, could be detected. That drawn on the seventh day was turbid, and on cooling deposited a sediment composed of coagulated albumen and fibrin, with what appeared to me to be pus-globules here and there. These, if I was not mistaken in their character, must have come from the internal orifice of the puncture, which was still leaking.

Remarks.—This is the seventh case of spina bifida which I have treated by iodine injections. In no case have I seen it produce dangerous symptoms. It is the third unaccompanied by hydrocephalus; all these three has been perfectly and permanently cured—one with thirteen injections, one with two, and the last with one. In the last two, means were taken to prevent the passage of the solution into the spinal canal. In one, the tumour being pediculated, this was easily done; in the other, the means above described were resorted to with satisfactory results. When this can be effected, the solution may be used strong, and washed out so as to render one or two operations sufficient. The object of reinjecting some of the fluid in the case above reported, was to enable a hand around the pelvis to effects some pressure on the cord.

The operation is so delicate that it is not easy in any case to fulfil all the requisite conditions. Thus, in the above case, the walls were so thin at the point of puncture, that it did not close for ten days, constituting a source of danger. Some bubbles of air also passed in, too which too much consequence need not be attached, as no harm resulted; but it would be preferable to avoid such an occurrence.

Applications of collodion for the cure of spina bifida have been recently suggested. When the walls are thick and firm this may be safe, and will be as serviceable as other forms of compression. When the covering is thin, it is dangerous. Dr. James Gow reported, in the *Chicago Medical Journal* for November, 1860, a case where it caused ulceration and

rupture. Prof. Gross reports, in the *North American Medico-Chirurgical Review* for November, 1860, a case of this malformation, treated by injection of iodine. "The tumour was thoroughly painted over with collodion." The tumour opened (not at the point of puncture) on the second day, and on the sixth it "burst completely." Although the covering is stated to have been "on the point of bursting" before the operation, it seems probable that the collodion hastened if it did not cause the rupture.

In another case by Prof. Gross (*ib.*), where about ten injections were used in eight weeks, the collodion was kept applied, and the tumour burst, causing death. Concerning this case, there are two points deserving notice:—

1. As there is no reason to suppose that the rupture was caused by the injections, it must be attributed to the collodion.

2. As the tumour was found on dissection to be "about one-third obliterated by coagulable lymph," the inquiry naturally suggests itself, whether one or two injections would not have been sufficient. A certain thickening of the walls has indicated to me that further injections were unnecessary, and the loss of translucency, or the turbid appearance of the fluid withdrawn are indications of a change in the structure and action of the lining membrane, sufficient, with judicious pressure, to effect a cure.

As these cases of Prof. Gross, taken without detail, are calculated to discourage the trial, it may be well to note that, although about ten injections were made so as to pass in some degree into the spinal canal, "the child early suffered from the convulsions after the operations, and they always readily yielded to a dose of caster oil."

I regard both the cases of Prof. Gross as tending to show the safety and efficiency of this method of treatment, as in both plastic lymph was deposited within the sac without any dangerous symptoms attributed to the operation having occurred.

The manner in which collodion acts in producing ulceration is threefold: 1. By vesication; 2. By expelling the blood from the thin walls; 3. By increasing the tension of the walls of the sac, which it does by diminishing its size.

CLINICAL LECTURE ON CEREBRAL SYMPTOMS INDEPENDENT OF CEREBRAL DISEASE.

DELIVERED AT THE HOSPITAL FOR SICK CHILDREN, JAN. 26, 1861.

By CHAS. WEST, M.D., Physician to the Hospital.

The first set of conditions in which I have observed anxiety excited among non-professional persons, and occasionally among medical practitioners also, is when marked impairment of the intellectual powers, or marked alteration in the disposition, follows on convalescence from some serious illness, such illness having usually been of a febrile character, and probably having been typhoid fever more frequently than any other disorder.

Now, with reference to all these cases, it must be borne in mind that the younger the child, and the humbler its acquirements before the attack, the more far reaching will be the apparent results of any such illness. The disorder that befell the child who had not yet learned to speak, will postpone the attempt for months. It will reduce the little prattler, who had used its newly-acquired powers for a few months, to silence for several weeks, while it will manifest its effects in the older child by taciturnity, apathy, and indifference to its ordinary pursuits.

These effects are far more striking in the child than in the adult, not only because a similar impression produces a far deeper influence on the more fragile than on the stronger being, but also because the processes of growth and development, complete in the adult, are still in progress in the child, and after their interruption by disease, provident Nature cares first for the essential—the repair of the body—and does not till afterwards expend her energies in restoring the vigour of the mind.

Moreover, I remember no instance in which typhoid fever, or any other disease of which cerebral disturbance has not constituted a main feature, has been followed by permanent enfeebling of the mind, or by the development of disease of the brain, save indirectly by the production of tuberculosis and the subsequent supervention of tubercular hydrocephalus. It is, then, towards this point that attention should be mainly

directed, and if the general nutrition is carried on well, no temporary dulling of the mind, no waywardness of the temper need make you falter in your assurance that time will set all right again.

At various epochs of development, symtoms not unfrequently appear which excite apprehension of cerebral disease, such symptoms consisting chiefly in altered disposition, in intellectual dullness, in irritable temper; but we shall, I think, usually interpret their meaning rightly by observing two things. They are moral and intellectual, much more than physical, in their nature, and they either coincide with, or follow, some definite stage of bodily development, such as the second dentition, or, in after age, the first efforts at pubescence, while, moreover, they are too variable, both in kind and degree, to tally with the indications of any definite organic disease of the brain itself.

Similar symptoms occur sometimes as the result of overtasking of the mental powers; and this not always by work excessive in itself, but excessive with reference to the then condition of the child, who may at one time be unequal to the amount of work which, a few months before, it was able easily to accomplish. The nature of the child's studies, too, sometimes overtasks its powers even more than the number of hours devoted to them, and, in such circumstances, the mere altering their nature, even though unaccompanied with any diminution in the time occupied by them, will often suffice to set matters completely right.

It is usually in connection with the development of the system which accompanies the second dentition that we meet with the severe neuralgic headaches of dyspeptic children. The history of such cases is usually something of the following kind: A child, whose general health has never been robust, whose nutrition is but imperfect, whose bowels are sluggish, and liver inactive, has occasional attacks of pain in the head; the pain is, for the most part, referred to the forehead, is attended with some intolerance of light, with sense of sickness, and, in some instances, with vomiting. It is usually very severe, so that the child seeks for perfect quiet, for a darkened room, and often asks to go to bed, where the attacks often subside after a short sleep, in the course of a few hours, though sometimesit it is not until after a night's rest that they pass away completely. On the day after an attack, however, the child seems in his usual health, though slight, over-excitement, over-fatigue, or mental effort will reproduce

the pain, as will any error in diet, or want of attention to the state of the bowels. Independently, too, of any exciting cause, the attacks are apt to come on spontaneously every fortnight or three weeks, and their frequent recurrence at length excites the apprehension of the relatives of the patient, who cannot believe but that such frequent returns of severe suffering must needs imply the existence of formidable disease.

It is not easy to say how long, in any instance, these symptoms may continue. They are obviously dependent on the state of the general health, with the improvement of which they diminish or altogether disappear. The period of their most common occurrence seems to point to some connection between them, and the general state of the system which accompanies the evolution of the teeth; but they do not seem dependent, as some convulsive affections of infancy and childhood appear to be on the local irritation of one or two teeth in particular, ceasing as they pierce the gum. If I were to seek for an analogy, I should find it rather in that condition of the general health which in the girl at puberty accompanies the difficult and tardy development of the menstrual function, and which improves when that process is complete, and the function fully and regularly established. In confirmation of this view, I may add, that while in the boy it is very unusual to observe this headache occur at the period of puberty, in the female sex the same kind of suffering not seldom recurs at that epoch, and sometimes, as we all know, continues in the woman even during the whole time of sexual activity, each recurring menstrual period being attended by intense headache, with much gastric disorder, though perhaps with little uterine pain, sometimes, indeed, with no pain at all referred to the sexual organs.

Pain in the head, accompanied with more or less intolerance of light, sickness, and constipation, are, as I scarcely need remind you, the symptoms that ordinarily usher in tubercular hydrocephalus; and though the knowledge of the public is inaccurate, they yet have a vague notion that such as these are the ordinary accompaniments of water on the brain, and they will come to you for a solution of their doubts, and a relief of their apprehensions. Now, I confess that, in many instances, the off-hand answer which is most desired is impossible; while, unluckily, there is no infallible criterion by which the caution suggested by wise observation can be distinguished from the hesitation of untaught inexperience.

Anyhow, it is worth while to have impressed on your mind the fact that the symptoms I have just enumerated do not *always* have so grave an import as commonly belongs to them, and that it is worth while to pause in every case before assigning to them their most untoward meaning.

These symptoms are for the most part observed a little later in life than the age at which tubercular hydrocephalus is most frequent, and they usually coincide with the progress of the second dentition. Further, although they are generally observed in children whose digestion has been liable to frequent disorder, and who are comparatively ill-nourished, the headaches are not preceded by that progressive loss of flesh or deterioration of the general health, which, in many cases, though confessedly by no means in all, precedes the development of acute hydrocephalus. Moreover, it will often be found that the headaches have continued to recur at intervals for weeks or months before the patient came under your notice, that yet no progressive deterioration has been taking place in the child's condition, that the headaches are not more intense, that no fresh symptom of cerebral disorder has supervened; but that such as they were months before, such they continue still. The attacks of headache themselves present some characters by which they may be distinguished from those whose import is more formidable. They are not attended with any remarkable increase of heat of head, nor with any marked pulsation of the carotids. The pulse, though quickened, is rarely unequal or irregular; the bowels, though constipated, answer comparatively readily to aperients; actual vomiting is unusual, and the nausea even rarely outlasts the seizure. Stimulants, too, not unfrequently relieve the pain, instead of aggravating it, and though excitement or over fatigue may have brought on the attack, yet a tale that interests or arouses the child, or any occurrence which brings to it much pleasure, often dissipates the pain completely; while, moreover, the spirits in the intervals become as buoyant as ever, and continue so until the next attack, a marked contrast to the anxiety and depression which often precede for weeks or months the onset of the acute stage of tubercular hydrocephalus.

Pure neuralgia, like the neuralgic headache of the adult, though less common than this sick headache, if so I may term it, is yet sufficiently frequent to need being borne in mind, when the question arises as to the import of symptoms supposed to indicate cerebral disease. The headache in these

cases is usually frontal, and care is therefore the more necessary, since there is no doubt but that continued frontal headache is a very frequent accompaniment of organic disease of the brain, and especially of tubercle of that organ. The severity of the pain, the suddenness of its onset, the completeness of its cessation, the fact that its recurrence for days is attended by no progressive deterioration in the patient's condition, all furnish a clue to its real nature. Moreover its supervention after exposure to malaria, and a certain ill-marked periodicity in its return, are circumstances which will serve in many instances, no less than the absence of other signs of disease of the brain to guard against, too hasty, or too positive an expression of an unfavorable prognosis.

There is besides another large class of cases, in which the occurrence, not merely of vague indications of cerebral disorder, but of violent convulsive attacks, excites alarm, proportionate rather to the formidable nature of the symptoms, than to the importance of the cause on which they really depend.

One of the most remarkable instances of this class which I have ever met with, was furnished by a little girl, 6½ years old, who suffered much from ascarides, on account of which she came under my care on September 16, some years ago. She had benefited somewhat by aperient and other treatment, when on the evening of October 7 she complained of pain in the chest; and at eleven in the evening, having then been some hours in bed, she was seized with a fit, which did not entirely cease till two o'clock the next morning, when she fell asleep, and awoke apparently well about seven o'clock. At nine a second fit occurred, which lasted till eleven; and from that time till the afternoon of the eleventh, fits continued to recur, having at no time a longer interval between them than six hours.

The fits were not quite like ordinary epilepsy; they began with slight rolling of the eyes, and twitching of the mouth, to which succeeded very rapid movements of the throat as if in efforts at deglutition, and these movements became soon accompanied by a sound somewhat between that of a sob and a hiccough, and not unlike the sob of a hysterical patient. During this time the pupils became dilated, the pulse feeble, and the child partially insensible, but she never became absolutely so, and complete consciousness returned long before spasmodic movements ceased, or the convulsive sound in the throat subsided; the child, when asked if she was in pain,

pointing to her throat. Very active purgation, during which a large quantity of ascarides was expelled, was followed by the cessation of the convulsive attacks; but for nearly thirty-six hours afterwards, the child complained of pain in the throat, and swallowed difficultly and with a sort of convulsive effort.

Now, how formidable soever the symptoms of disorders of the nervous system may be, it is a rule, subject, I think, to a very few exceptions, that the more anomalous such symptoms are, the greater is the probability of their depending not on grave organic disease, but on some excentric and generally removable source of irritation. In infancy we are so aware of this fact, that when convulsions occur, our first impulse always is to seek in some excentric disturbance for their occasion. I think, however, that we are too apt to forget that this peculiar susceptibility continues, to a great degree, through all the years of childhood.

In the case just related, the presence of a large quantity of ascarides produced a succession of violent convulsions, which ceased permanently on their complete expulsion. Sometimes, however, the irritation occasioned by the existence of worms in the intestines has more of an intermittent character coinciding with the movements of the parasite, and subsiding for a time on the expulsion of a lumbricus, or the returning quiescence of the tape-worm.

A little boy, 7½ years old, nervous, excitable, ill-managed, and liable to night-terrors, woke at four one morning, crying; the cries were soon succeeded by an attack of convulsions, which differed from an ordinary epileptic seizure, it being attended by a less profound degree of insensibility than ordinarily accompanies it. For a few weeks the child continued peculiarly excitable, wayward, and fretful, two more convulsions then occurred, soon after the last of which he voided a large lumbricus. This occurrence was followed by a marked improvement, which lasted for a few weeks. The old symptoms then returned, followed by another convulsion, and then another lumbricus was expelled, once more with an amelioration of the symptoms, and a second cessation of the fits. Whether the improvement was permanent, or whether the former symptoms returned, I cannot say, as I lost sight of the patient, but enough has been told of the child's history, to show the connection between the intestinal irritation produced by the worms, and the violent disturbance of the nervous system.

Though I have given these illustrations of nervous symptoms dependent on the presence of worms, and it would not be difficult to add to their number, it is yet not out of place to caution you against assuming the presence of worms merely because such an assumption furnishes you with the readiest clue to the meaning of certain symptoms of cerebral disorder which you do not find it easy at once to account for. I have seen the early stages of acute hydrocephalus referred to worms, just as I have seen the indisposition which ushered in typhus fever referred to them, without the slightest evidence of their existence, but of mere mental indolence on the part of the practitioner which indisposed him from careful observation or thoughtful consideration, and led him to take up with the hypothesis which served most readily to relieve him from the task of watching and reflection.

When symptoms of cerebral disorder depend on the presence of worms, there has almost always been ample evidence of their existence before the nervous system became gravely disturbed by them. In the few exceptions to this rule it may be asserted almost positively that their appearance will follow nearly at once on the cerebral disorder which awakens our anxiety and the alarm of the patient's friends. Moreover, the observation I have just made as to the influence which the anomalous character of symptoms fairly suggests, may be borne in mind in all doubtful cases with much advantage; and the question deliberately propounded to yourselves, "Of what definite disorder of the brain or nervous system are these symptoms; or in what respects are they anomalous and discrepant?" will often save you from many grave errors and many useless regrets.

We are all so familiar with the occurrence of convulsions during the first dentition, that in infancy the risk is rather of the grave disease to which they are possibly due being overlooked, than of the influence of teething in their production being underrated. On the other hand, the occasional share of the second dentition in exciting epileptic or other convulsive seizures is too little borne in mind, and a graver prognosis than the event justifies is sometimes expressed in consequence.

In a little work on Dentition,* published some years ago by my friend and former colleague, Dr. Ashburner, there are many cases related illustrative of this fact. Of these, I will select the following:

* On Dentition, etc. 12mo. London, 1834, p. 97.

"A boy, twelve years of age, was cutting the second or posterior permanent molars of the upper jaw before those of the lower, and the process was accompanied by twitchings of various parts of the body. At last he became affected with chorea. Being a very nervous lad, if any notice were taken of him, he would quite involuntarily make the most extraordinary faces, and contort his body into various attitudes that appeared to be most difficult and painful. This chorea continued for three months, during which time a variety of medicines were swallowed. At last he fell into an epileptic fit, struggling much, foaming at the mouth, and grinding the teeth. I thrust my fore-finger along the inside of his cheek, and found a hard, cartilaginous space on each side, behind his first molar tooth. I succeeded in gashing these parts. He uttered a scream and fell out of his fit, becoming quite sensible, nor had he a recurrence of his chorea."

So sudden and complete a cessation of symptoms on the removal of the mechanical irritation produced by the pressure of a tooth is decidedly an unusual occurrence. In by far the greater number of instances, the symptoms of disorder in the nervous system do not admit of being cut short thus suddenly and decisively; they depend not simply on the local irritation produced by one particular tooth, but, like the headachs which I spoke of at the commencement of this lecture, they are the result of the disturbance of the nervous system, to which the whole process of development has given rise, just as, in later life, the hysteria of the young woman is connected with the imperfect accomplishment of sexual function, and is not removed by a single occurrence of menstruation.

If this class of cases may be referred the history of a boy between eleven and twelve years old, whom I saw some years ago. While, apparently, in good health he was atacked by a fit one morning, in which his head was drawn to the right side. His face was distorted, especially his right side, and his right arm was in much more violent movement than his left. This fit was not preceded nor followed by sleepiness or headache, nor was it attended by any loss of consciousness, and the same characters were observed in all his subsequent seizures except one, which—the third in order of occurrence—was followed by temporary delirium for five or ten minutes. With the exception of the first and third of these attacks, all the others ceased in a minute, and the instant the spasmodic movements subsided, the boy resumed his former occupation, as if nothing had happened. Only once did more than one

seizure take place in the course of twenty-four hours; but the intervals between two attacks were very irregular; sometimes eight days had passed without an attack, while, at other times, they recurred daily for three days; and, altogether, between the beginning of July and the end of December, more than fifty occurred, with no alteration of their character or increase in their severity, while neither the boys' health nor his intellect appeared to have suffered in any respect from the affection. One point observed with reference to them—which, I may add, is often noticed in cases of epilepsy—was, that they almost invariably happened soon after rising in the morning, generally between the hours of seven and nine o'clock.

At first, he was actively purged, but with no effect; he then took the valerianate of zinc likewise fruitlessly; and then, as he was cutting the second molar tooth in the right side of the upper jaw, and as there was much tenderness of the gum over it, the gum was freely lanced, and all treatment was suspended. No amendment followed this measure, and the boy was, therefore, put for a time on the nitrate of silver, but with no results.

The idea which had been entertained of the possible connection of the attacks with the process of dentition appeared to me still to be the most probable, and for the following reasons: That, in spite of the continuance of the attacks, there had been no such deterioration in the boy's condition as might have been expected if they had been dependent on cerebral disease; that no impairment of powers over the affected side had followed the attacks, while such an occurrence would have inevitably occurred if the attacks had been dependent on tumour or tubercle in the brain; that headache was completely absent, and all the general functions were perfectly well performed; while, further, the anomalous character of the attacks themselves seemed still further to point to some excentric source of irritation.

On looking into the boy's mouth, the teeth in the upper jaw were observed to be very crowded and overlapping each other; the first molar on the left side was decayed, the second molar was still beneath the gum. I advised the extraction of the decayed tooth, and lancing the gum over the second molar, while all medical treatment besides should be discontinued. Before these measures were adopted, the boy had six consecutive attacks in the course of one day; two of them being very severe, and attended like ordinary epilepsy, with loss of consciousness. The extraction of the decayed tooth was followed by immediate diminution in the convulsive attacks, both in point of

frequency and severity, and the improvement lasted for nearly two months. The second molar tooth was then partly through the gum, when a succession of seizures, some of them accompanied by loss of consciousness, once more took place. Free lancing of the gum was succeeded, as before, by immediate improvement, and not only so, but the tooth being now quite through the gum, all spasmodic movements of the arm ceased, and occasional slight twitchings of the face were the only relics of symptoms which had seemed so formidable.

One caution, which this case suggests, I cannot forbear to offer, although it is not immediately connected with the subject of this lecture. It relates to the possibility of attacks of this nature, and still more of those of a more decidedly epileptic character, becoming permanent as the mere result of frequent recurrence, and this quite independently of the existence of any organic mischief in the brain. Thus, I have seen instances in which the convulsions that originated in whooping cough, have outlasted the disease that occasioned them, and the fits which at first were due to some error in diet, reproduced again and again by similar though perhaps smaller indiscretions in the same respects, until they became at length habitual. Each fit, too, leaves the child more predisposed to its occurrence, and from slighter and still slighter causes; so that never is the old Latin adage, *Obsta principiis*, more important than in the case of the convulsive diseases of early life.

In the majorisy of cases of chorea no diagnostic difficulty arises; the irregular movements of the limbs, the strange grimaces and gesticulations, sufficiently characterize the disease. Now and then, however, though the movements of the limbs are very slight, or partial, the speech is much affected, and the child, partly, perhaps, in consequence of the difficulty in communicating its ideas, becomes dull, low-spirited, and apparently sullen, and apprehensions are thus excited lest these unusual symptoms should betoken disease of the brain.

A boy, aged 8¼ years, whose health had always been delicate, though he had suffered from no special illness, seemed feebler than usual when he returned from school for his Christmas holidays, and his mother's anxiety was excited all the more with reference to his indisposition from the circumstance that his father had died of consumption. In the course of a fortnight from his return home, it was noticed that power over his right hand was much impaired, and three days after, power over his right leg failed also, and his speech became at

the same time much affected. The speech grew rapidly more and more unintelligible, the boy stumbled when walking, and occasionally fell, and there were slight twitchings of the muscles of the right arm and leg, though these were at no time remarkable, and the face was never distorted. With the progress of these symptoms, too, the boy, never very quick, had become peculiarly dull and apathetic, so that it was not to be wondered at if the attention of his friends became fixed on those symptoms which were of the gravest import, and were apprehensive lest they should betoken disease of the brain.

Close inquiry, however, elicited facts that seemed to warrant the more hopeful view which the event of the case fully justified. There was no complaint of headache, there had been no sickness; the pulse, though feeble, was not all irregular; the tongue was protruded straight; the pupils were equally dilated, and equally susceptible to the influence of light; the movements, which ceased completely during sleep, were unaccompanied by any rigidity or contraction of the muscles of the affected limbs, and close observation discovered that though extremely slight on the left side, the irregular movements did affect both sides of the body. In a week or two more the affection of the left side became quite as marked as that of the right, deglutition, too, as well as speech, became affected, and the anomalous symptoms merged into those characteristic of an ordinary attak of somewhat severe chorea, from which under general tonic treatment the boy recovered, the brightening of his mind preceding, as I have seen it do in other instances, the amendment of the purely choreic symptoms.

I have seen, two or three times, a peculiar spasmodic affection in children which, though I believe it to be of no serious moment, yet has attracted attention, and excited anxiety by its singularity. It consists in the extremely frequent occurrence of involuntary sighing respiration: the child, who seems otherwise in tolerable health, and who follows his usual occupations and amusements, though listlessly and languidly, fetching a deep sigh almost every second or third inspiration, with a most painful and depressing monotony. All day long the sighing continues, ceasing, indeed, at night when sleep is undisturbed, but beginning again in the morning. No external condition appears to check, or indeed much to modify it; it is usually worse when the child has been long without food, but eating does not put a stop to it, and the child sighs, as if most woe-begone, between each few mouthfuls that he

takes. Once I saw the sighing followed by a causeless attack of difficult breathing similar to the nervous dyspnœa of a hysterical patient, but usually from beginning to end the sighing continues the only symptom of illness. The attack comes on gradually, and subsides in the same manner. In the instances which I have seen, however, it did not continue for much above ten days with such distinctness as to force itself upon observation, but abated by degrees under the employment of mild tonics, and of attention to the digestion, which usually is more or less disordered.

I have never seen it associated with other symptoms pointing to disorder of the brain, nor have I known it issue in any graver ailment, but its singularity has excited fears which perhaps this mention of it may serve to allay.

I must not close this lecture without some reference to a very important class of cases, to which, indeed, I hope on a future occasion to call your special attention, where the loss of power over some of the muscles raises the suspicion that the brain is the seat of serious disease. In the adult, we are familiar with the occasional occurrence of partial paralysis, especially of fascial palsy, independently of cerebral disease. We can therefore the more readily understand how a similar occurrence may take place in the more sensitive and delicate frame of the child without any abiding disease of the nervous centres. Those slow processes of disorganization which, affecting the brain, in the adult produce palsy, sometimes of one part, sometimes of another, so that we look on the impaired power of movement as the attendant commonly on some grave disease, and the harbinger of its fatal issue, are of extreme rarity in the child. Tumors, almost invariably tuberculous, within the brain, or disease of the spinal column extending from without inwards, until by its advance the cord itself becomes implicated, are almost the only conditions in which paralysis in childhood depends upon mischief seated in the nervous centres. In the young, the loss of power is indeed uncertain in its issue, as far as the complete recovery of the patient is concerned; it is grievous in its results, for it often leads to permanent deformity; but it is very rarely that it need excite apprehension with reference to life, or health, or intellectual power. In the grown person, the import of paralysis is commonly of the gravest kind, subject, indeed, to exceptions, of which fascial paralysis furnishes the most frequent illustration. We are bound, indeed, to scrutinize each case most carefully; but in the grown person, our inquiry

commonly resembles that which the Judge puts to the condemned criminal when he asks him whether he has anything to say why sentence of death should not be passed upon him. In the child, care, too, is needed not to overlook some peculiarity in the case which may attack to the loss of power a worse than is wonted to significance; but yet you will do well to remember that life is very rarely threatened by paralysis in early life; that organic disease is the rare exception, not the ordinary occurrence. It will save you much useless anxiety, and your patient's friends much needless sorrow.

Medical News.

NEW ANÆSTHETICS—THEORY OF THEIR ACTION.

By CHARLES T. JACKSON, M.D.

Substitutes for ether, as anæsthetic agents, are frequently proposed, and some of them have been practically introduced, with some success. None, however, surpass ether in the two most important qualities of efficiency and safety, and there can be no doubt that with respect to safety, ether is far preferable to any and all anæsthetics thus far discovered.

It may prove interesting to the profession, to inquire into the mode of action of the class of bodies known to produce anæsthesia, when inhaled. This subject has been very carefully studied by me from the outset of anæsthetic practice, and with a view to the discovery of some general law.

The first impression among physicians was that the anæsthetic state was merely one of temporary intoxication.

Secondly, the theory of high excitement, followed by corresponding collapse, accounted for the phenomena. Dr. Jno. C. Warren took, at one time, this view of the matter, and spoke of etherization as "devouring the sensibility by high stimulation, and hence a corresponding nervous depression," which was the anæsthetic state. Others have supposed that etherization produced a partial asphyxia; hence the expression early made use of by some of our surgeons, that there was "little difference between hanging, drowning and etherizing."

It has also been alleged that ether absorbed into the sanguineous circulation affects directly the nervous filaments,

either at their origin in the medulla spinalis, or in their distributed extremities, or in both these parts. In support of this allegation, it was cited that the direct application of ether to an exposed nerve *destroyed* its sensibility. By the italization of that word, I call attention to the difference between the anæsthetic state of temporary suspension of sensibility, and the destruction of it; for the nerve acted upon directly by ether, does not recover its powers, but is permanently paralyzed.

Another state of the circulation has been observed, which it is hoped would give some clue to the action of anæsthetic agents, namely, that of slackening, and even temporarily wholly suspending the circulation of blood in the capillary or extreme vessels. It was supposed that by thus cutting off a supply of circulating blood stimulus to the sentient extremities of the nerves, sensation was temporarily suspended. The commencement of insensibility in the remote extremities, the feet, legs and hands, seems to indicate that sensation was suspended at those points first.

The French physiologists, Flourens and Longet, are of opinion that the effects of anæsthetics commence, and primarily act on the great nervous centers, the medulla spinalis and medulla oblongata; and that if the full effect reaches the bulb of the medulla, death will take place from total suspension of all the vitat functions of the body.

A more chemical explanation of the action of anæsthetics is that they all abstract oxygen from the blood, and hence reduce its peculiar stimulating powers on the nerves, and that some of them leave poisonous products, while those left by others are innocuous. Thus, as we have formerly stated, chloroform or the ter-chloride of formyl abstracts three equivalents of oxygen from the blood, but, at the same time, unfortunately it deposits, in exchange for the oxygen, three equivalents of chlorine.

Bi-sulphide of carbon, one of the most terrible anæsthetics ever proposed, the dangerous effects of which I have experienced, and have warned the public about seasonably, acts as a powerful de oxidizer of the blood, both the carbon and the sulphur abstracting oxygen, the first producing carbonic oxide or carbonic acid, while the latter forms sulphurous acid. Carbonic oxide and sulphurous acid are poisons, as is also chlorine, before mentioned.

All the acidiferous ethers when decomposed, as they are, in the organs of respiration and circulation, leave their acids in

combination with the blood; hence, nitrous and nitric ether are known to destroy life, and hydro-chloric ether and chloride of hydro-carbon undoubtedly act in the same way, and injure the quality of the blood. Acetic ether is not objectionable, since an organic acid is easily decomposed in the processes of respiration, and is removed in the form of carbonic acid and vapor of water, usual products of normal respiration.

Sulphuric ether, as it is improperly called, since its does not contain any sulphuric acid, is a pure hydro-carbon, with one equivalent of oxygen—$C_4 H_5 O$. When decomposed by the action of the blood, it may be converted into aldehyde, acetic acid, and lastly into carbonic acid and water, no fixed product remaining in the blood, but all able to be removed by respiratory action. The odor of the breath of a patient who has been etherized, shows that there are exhaled the oxidized products of the ether, and it is known by analysis that a much larger proportion of carbonic acid is exhaled from the lungs during the etherized state, than in the normal condition of the system.

Without finally adopting any theory of the chemical and physiological action of anæsthetics generally, we may, perhaps, be allowed to call attention to a general law, namely, that all very volatile hydro-carbons act as anæsthetics like the others. Thus, it has long been known that benzine, benzole, oil of turpentine, naptha, when inhaled, will all produce the anæsthetic state. The highly volatile oils of coal tar, likewise, possess anæsthetic properties, and one which has recently been tested in surgical practice, known as keroselene, a highly volatile naphtha, seems to be the least offensive of them. It is evidently a very pure hydro-carbon, analogous to highly rectified naptha, and does not contain any oxygen, as is proved by its property of preserving potassium from oxidation, when it is immersed in it. The first samples of keroselene which I tested, two years ago, proved quite irritating to the organs of respiration, but I have learned recently that a purer and more volatile product has been made at Mr. Downer's works, though I have had no opportunity of testing it practically.

It is obvious that there are two or more volatile oils in the keroselene of commerce, and they are separable by graduated distillation. Some care, therefore, is requisite in the preparation of an uniform product; one which may be properly the subject of experiments by inhalation. I would observe that no analysis has yet been made of the keroselene oils.—*Boston Medical and Surgical Journal.*

NEW SURGICAL PRINCIPLES.

Prof. E. S. Cooper advances and urges discussion of the following surgical principles:

1st. That atmosphere, admitted into the joints or other tissues, is not a source of irritation or injury, except where it acts mechanically; as, when admitted into a vein, by producing asphyxia; into the thoracic cavity, by its pressure producing collapsing of the lungs, or when, by the long-continued exposure of a large amount of surface of any of the internal organs, whose normal temperature is much above that of the atmosphere, it reduces it so as to produce a morbid action.

2d. That the division of entire ligaments about the joints is no impediment to their ultimate strength and mobility; but, on the other hand, this operation will often greatly facilitate the cure, by enabling the surgeon to open the affected part fully, for the purpose of applying medicinal substances to the articular surfaces, when these are ulcerated or otherwise diseased.

3d. That the only true mode of treating ulcerations of bone, however slight, within the joint, is to lay it open freely, and apply remedial agents directly to the part affected.

4th. That opening the joints early, in case of matter burrowing in them, is far more imperiously demanded than the opening of other parts thus affected, and the operation produces no further pain or inconvenience to the patient, in any respect, than when performed on parts remote from the joints.

5th. That after opening a large joint, the knee, for instance, by an incision several inches long, the wound should be kept open by the introduction of lint, or other similar substance, until the parts within the articulation become healthy, and, in all cases, it should be made to heal by granulation.

6th. That extensive wounds, opening freely the large joints, such as the knee, (even when lacerated, as by a saw, which must necessarily heal by granulation,) do not as often give rise to violent symptoms as very small wounds, such as are made by the corner of a hatchet, an adze, or a pen-knife, which heal on the outside by first intention.

7th. That there are no known limits beyond which a tendon will not or cannot be reproduced after division, provided the parts are made to heal by granulation, and that the present acknowledged rule of two inches being the maximum distance in which the divided ends of a ligament or tendon can safely be separated, has not the least foundation in fact.

NOTES ON THE NARCOTICS.

By EDWARD PARRISH, Lecturer on Pharmacy, *Philadelphia.*

An experienced medical practitioner, in a recent letter to his office student, in attendance on medical lectures, advises him to acquaint himself thoroughly, during his term of study, with affections of the nervous system, as upon a thorough knowledge of these, and their treatment, his success in practice would mainly depend.

That this advice accords with the prevailing ideas of physicians, is especially obvious to the pharmaceutist, who, in comparing the recent prescriptions, on his files, with those of twenty years ago, cannot fail to notice the increased use of medicines primarily affecting the nervous system, instead of mercurials, drastic cathartics, blisters, and the like, formerly so much relied on.

From an analytical table of prescriptions which I prepared some five years ago, from my own files and those of several pharmaceutical friends, it appeared, that on an average 24 per cent. of the prescriptions examined, contained either opium, morphia, or hyosciamus, in one or other of their preparations, while the mercurials of all kinds, of which blue pill is now by far the most popular, were directed in 23 per cent. of the prescriptions; iodine and iodide of potassium in only 6 per cent., and though the files were examined with reference to the different seasons of the year, cinchona, and its alkaloids, only appeared in 9 per cent. of those written in Philadelphia. The preponderence, here shown, would probably be greatly increased in case of the preparations of opium, if the medicines dispensed without prescriptions were taken into account. Laudanum and paregoric are found in almost every dwelling, at all provided with medicines, while the great variety of carminatives and infant cordials, given so indiscriminately and so injudiciously, nearly all contain opium as their most active ingredient.

In estimating the reliance placed by physicians upon narotics, by the data above given, allowance must be made for their extensive employment as correctives of the undue influence of agents primarily affecting the secretions. This is,

indeed, one of their chief uses in prescribing, and in the case of opium, especially is, perhaps, often resorted to from habit, rather than from any indication in the symptoms.

Next to opium hyosiamus is the most popular of the class of cerebral stimulants; its relaxing effect upon the bowels, secures its substitution for opium in very many instances; as an alterative, also, it shares with conium, belladonna, and stramontum, considerable reputation in appropriate combinations. The prophylactic effects of belladona, its asserted specific influence on certain eruptive diseases, and its well known usefulness is opthalmic surgery, give its extract and alkaloid, atropia, prominent positions in the class. Conium is not unfrequently prescribed with sarsaparilla and the mercurials, while stramonium is less in repute for internal use than in ointments applied to hæmorrhoids. Stramonium leaves are much employed for fumigation in asthmatic affections, a practice frequently productive of speedy relief, notwithstanding its alkaloid, daturia, is not volatile; that of conium being freely so its leaf might be supposed to furnish a much better material for the fabrication of asthmatic paper and segars. Another eligible mode of administering this class of remedies, especially those containing volatile principles, is by inhalation in connection with the vapor of water; the inconvenience of the method and the want of suitable apparatus have sometimes operated against a trial of its merits; there is no real difficulty, however, in adjusting a good inhaler, when not readily accessible, by the use of a wide-month bottle and glass tube.

Of all the narcotics, none has received so great an impulse, in our time, as Indian hemp. The incredible stories recorded by travelers in relation to the effects of *hashish* on the impressible natives of the East Indies, have given it a world-wide notoriety as an intoxicant, while the efforts of certain empirics, among us, who have advertised it extensively, under the plea of disinterested humanity, have drawn the attention of thousands, both in and out of the profession, to its availability in the treatment of phthisis. The extract of cannabis has, certainly, become one of the most popular, as it is one of the best of its class; its chief advantages are the exhilaration which accompanies, or rather precedes its complete narcotic effect, the remarkable control it exerts over nervous inquietude and the absence of any noxious effect, either in diminishing the appetite, checking the secretions or constipating the bowels. The quality of the preparation is so varied, that

physicians are often quite uncertain what dose to prescribe; some specimens seem nearly inert, while of others half a grain is a powerful dose, and a grain has produced alarming symptoms. It is always best for the physician to assure himself beforehand on this head. It should be of a bright green color, heavy narcotic odor, and entirely soluble in alcohol. Squire's London manufacture is esteemed the best. In prescribing extract of cannabis, in liquid form, the most approved combination is with carbonate of potassa, which renders the extract soluble in water, otherwise, dissolved in alcohol, it readily separates on being added to aqueous and even mucilaginous preparations. I have met with one case only in which extract of cannabis produced those extraordinary hallucinations to which I have referred as being ascribed to *hashish* in the East. This patient, a consumptive, was often possessed with an idea of his own duality, seeing horrid visions of detached portions of himself. He seemed to be continually haunted by the presence of an imperious director, on whose behalf his most trifling acts were performed. At times, even in the act of expectoration, he believed himself the agent of another for whose sufferings he felt the keenest sympathy.

The very extensive use made of lobelia and sanguinaria in this country, would, I think, surprise our transatlantic calaborers. The combination, in these remedies, of narcotic with emetic and diaphoretic properties, fits them for a great variety of indications, though they seem to me by no means so safe and harmless as some rather adventurous prescribers seem to suppose. A plant of the famous solanaceæ family, to which belladonna, stramonium, and hyosciamus belong, yields us the alternative narcotic dulcamara, of which we have only two preparations in the Pharmacopœia—the decoction and aqueous extract, neither of them very eligible or apparently satisfactory to the profession.

One very prominent element in the popularity of a remedy is its pharmaceutical eligibility, and there is little doubt that the neglect into which many valuable drugs have fallen is due chiefly to their not being presented to the practitioner in an eligible shape. Since the general abandonment of the crude and inelegant class of infusions and decoctions, there has been a manifest tendency to employ more concentrated and reliable preparations; but the Pharmacopœia, never in advance of the demands of the profession, has given no formulas in the cases of many of the most valuable. That this may be partially remedied in the edition now under revision

by the eminently judicious and conservative committee appointed in Washington some eighteen months since, is greatly to be desired.

Fluid extracts are now loudly called for on all hands. That many of this class of liquid preparations originated, and have come into use through the commercial enterprise and activity of certain manufacturing pharmaceutists, not amenable to the careful scrutiny of the profession and the public, and whose processes are too uniform to be properly applicable to every drug, is no argument against the excellent scheme of concentrating liquid preparations to such point as that their dose shall have the same relation in each case to that of the drug from which derived. Modern pharmacy, with a full appreciation of the composition of almost every drug known to the profession, is now prepared to adapt solvents to each, which will fully extract its medicinal principles, discarding those which are inert, and, by processes of evaporation within the reach of every apothecary, to reduce these to concentrated and permanent forms. The alcohol is sometimes an objection in tinctures, from therapeutic incompatibility, while in syrups, which are always given in comparatively large doses, the sugar is equally objectionable. Fluid extracts, besides the advantage of correspondence of dose with that of the drug, contain a minimum of either of these antiseptic ingredients. They are, however, best adapted to drugs the doses of which are not very small, and I can see no advantage, for internal use, in more concentrated liquid preparations of the powerful narcotics than their tinctures already furnish, especially as the solid extracts are so easily incorporated with extemporaneous mixtures. The imported preserved juices are not recommended so much for greater concentration as for their careful preparation directly from the fresh expressed juice of the plant before it has been altered by any processes of drying and subsequent treatment with menstrua.

In this connection, it may not be out of place to notice some facts in regard to the preparations of opium, of especial advantage in those cases in which Laudanum is contraindicated by its nauseating effects and the disagreeable symptoms as its effects are passing off. McMunn's elixir has attained a place among the popular preparations of opium from the absence of these objectionable qualities, and the only obstacle to its use by physicians lies in its being a nostrum, the mode of preparation of which is carefully concealed. The prevailing opinion among pharmaceutists appears to be that this is an

aqueous preparation, to which, after its completion, a very little alcohol is added to prevent decomposition, and, on this principle, numerous elixirs of opium are offered, though, as might be expected, McMunn's still takes precedence. The aqueous extract is a preparation well worthy of a fair trial in competition with the drug itself, or its tinctures; on theoretical grounds, it gives promise of good results. I have met with practitioners who unhesitatingly give the preference to black drop and acetated tincture of opium, which they recommend as greatly preferable to the ordinary liquid preparation, while certain confirmed opium-drunkards give their testimony in the same direction, asserting that these preparations, containing morphia as acetate, produce less emaciation from their habitual use than those containing the natural salt, meconate of morphia. On the other hand, I have lately imported from London an elegant preparation called solution of bi-meconate of morphia, resembling McMunn's elixir, though still more completely deprived of odor, and apparently quite free from the usual objections to laudanum.

What is the dose of the morphia salts? One-eighth of a grain, say the older books and prescriptions; one-third of a grain, say recent authorities; one grain, say now a great many physicians, not only here but elsewhere. Formerly I hesitated to compound a prescription calling for this dose, now it is so frequently prescribed and administered, that we begin to regard it as safe, and cannot help setting down the fact as an offset to the asserted lessening of doses to meet the demand of the times.—*Med. Reporter.*

LECTURE ON DENTITION AND ITS DERANGEMENTS.

By A. JACOBI, M. D.,
Professor of Infantile Pathology and Therapeutics.

"*Anatomy and Physiology of Mucous Membrane in General—Nature of its Secretion—General Pathology of Mucous Membrane—General Etiology—Primary and Secondary Nature of Diseases—External Injuries—Cold—Atmospheric and Epidemic Influences—Constitutional Poisons—Contiguity and Sympathy—Different Forms and Symptoms.*

I have several times alluded to certain qualities and actions of the mucous membranes in general. But you will better understand many of the foregoing remarks, after following me in the investigation of several anatomical and physiological facts, concerning both the structure and function of the mucous membranes. And certainly, they are deserving of every attention that can be bestowed upon them, not only on account of the large surface they cover, but also in consequence of their physiological and pathological importance. As the cutis forms the external integument of the body, so does the mucous membranes form the internal covering of any and all the organs. Thus, we find them all over the respiratory, digestive, uropoietic, and sexual organs, and in all those isolated cavities, like the maxillary and frontal ones, which are connected with the larger ones by narrow ducts; further in the glands, the affections of which are either genuine and primary, or continuous only of a morbid process on a mucous membrane, and their ducts; the conjunctivæ, the external ear, and the galactiferous ducts of the female breast.

The mucous membrane of an organ or a system is not confined to certain limits. Except on the lips, on the external ear, and other localities where we distinctly perceive the gradual replacement of epidermis and cutis by mucous membrane of this organ or system finds its end, and that of the other commences. Thus, there is no boundary between the mucous membranes of the digestive and the respiratory organs, nor any between that of the stomach and duodenum. Their internal structure is alike, and therefore I deem it more proper henceforth to speak rather of mucous membrane, than of

mucous membranes. Its uniform layer consists of dense connective tissues, intermixed with blood-vessels and elastic fibres, in its deeper laminæ with muscular fibres also, and is covered with several layers of epithelial scales, which are readily thrown off and renewed; they may, however, be accumulated in yellowish, brownish, or black masses. Beside the blood-vessels there are lymphatic vessels, and the smallest ramifications of nerves, which are particularly found in the papillary prominences. They are either the last ends of a cerebral or spinal, or of the sympathetic nerve; the peculiar actions of these several nerves determining the functions of the locality in which they spread. The mucous membrane, influenced by the cerebro-spinal system, is more sensitive, as a general rule, than such localities in which the power of the sympathetic prevails. Thus, pain depends on the seat of the affection just as well as on its acuteness; the degrees of temperature are discerned by the pharynx, but not by the stomach or intestine; urine produces no pain whatever on the mucous membrane of the urinary bladder and urethra, but very much so on that of the conjunctivæ; and often irritations meeting a mucous membrane effect no pain or other local disturbance, but sympathetic sensations, like coughing or sneezing.

The functions of the mucous membrane are both various and important. It takes a prominent part in assimilation and sanguification, and therefore suffers in all general, and all those local diseases that in any way influence the general condition of the organism. They are frequently first affected in a large number of diseases, many of which are primary; for the immense extension of mucous membrane, increased by indentations, villi, glands and glandular ducts, and papilæ, is such that morbid processes may easily take place in one part or another. The influence of the diseased mucous membrane is, moreover, as great as its effects are frequent; the vital importance of the membrane itself, the legions of nerve ramifications in its tissue, and the contiguity and rapidly developed consecutive affections of the mucous membrane contributing to the same result. The occurrence of œdema of the glottis in catarrh of the pharynx or larynx, or of collateral œdema of the vocal cords in diphtheritic inflammation of the larynx, are distinct and much dreaded proofs of this fact.

In its normal condition, the mucous membrane exhibits a peculiar tough, whitish or clear, more or less transparent, alkaline secretion, called mucus. It contains mostly epithelial scales, more or less transformed, of every variety; pavement,

cylindrical, and vibrating, the latter without its cilia; further, round granulated cells with one or more nuclei, and a clear transparent liquid. Epithelium, mucus, and pus are found combined in many instances of secretion on the mucus membrane, the three various forms being, in this locality, but three different stages of the transforming epithelium. Under favorable circumstances, the mucous membrane forms puriform elements anywhere, but there is some difference in the process. The purulent mucus of the intestine contains very seldom puriform elements, that is, pus cells, except in cases of genuine ulceration; the same result is found on examination of the purulent mucus of the uterus and tubes. But no ulceration is required in the mucus membrane of the bladder or urethra to count immense numbers of pus cells in the puriform secretion of chronic vesicular catarrh and gonorrhœa. This difference depends on anatomical reasons. The intestine, uterus, and Fallopian tubes have cylindrical epithelium only, bladder and uretha, however, pavement epithelium. The mucus membrane will develop the more pus cells without the presence of real ulceration in proportion to the amount of pavement epithelium by which it is covered. Purulent though the secretion of other parts of the mucus membrane will look, it contains frequently nothing but cylindrical epithelium. The angular shape of the pavement epithelium enables it to form a cohering covering, which is not thrown off so easily as the round pus or mucous cells; thus the lower layers have full time to develop into mucous cells; which result being obtained, the whole mass is thrown off by either the pressure of the subjacent new layers, or the influence of the thin and less cohesive transudation from the blood-vessels, which, in its turn, forms another important element of the secretion. Whether it has a more important part than to be one of its elements, whether, for instance, from its substance cells may be developed, or whether the cells are under all circumstances but the later stages in the development of epithelial scales, is still an open question. This is certain, that what is called mucus is by no means always the same liquid, no more so than that the secretion of the external skin is alike on every locality of its surface. Its reaction is acid in the stomach, alkaline in the mouth and intestinal canal; a mucous substance is secreted from the parenchymatous substance of some organs, without the presence of cells; there are pathological liquids, as colloid, very similar to mucus; there is the substanc called after the name of Wharton, in the umbilical cord

of the fœtus and newly born, the cellular development of which cannot be traced; and nevertheless this "gelatinous connective tissue" is transformed into mucus. Thus, from an anatomical point of view, the secretion of the mucous membrane is not a uniform substance; neither is it uniform as to chemical composition. I have stated that its reaction differs according to localities. It frequently contains albumen, some little fatty substance, extractive matters, and some mineral elements, as chloride of alkalines and phosphates of earths. These mineral elements belong to the mucine, which is a nitrogenous, albuminous substance, swelling in water, but not dissolved by it, and to which the mucus owes its tough nature. Its chemical reaction differs according to its percentage of minerals, combination with other poisonous substances, or its own peculiar modifications. This difference is easily explained by the fact, that it is not performed in the blood and thrown on the surface, but is a production of the mucous membrane itself. Thus its constitution depends on the amount of follicles, epithelial scales, papilæ, and on the character of the epithelium; no matter whether it is formed directly from the epithelium undergoing its final changes, or from transudation through the walls of the capillary vessels.

In regard to the diseases of the mucous membrane, I have already stated both their frequency of occurrence and their proclivities for complication. Their tendency to sickness is, however, not uniform; individuality and age belonging to those influences which are most apt to modify the alterations taking place in their tissue or secretion. Affections of the mucous membrane are very rare in fœtal life, because of the absence of both mechanical injuries and functional disorders. In infantile age the mucous membrane reaches its greatest importance, new influences acting upon it and calling into life new functions, especially the normal state of injection, which is very considerable indeed. A very common alteration taking place in the mucous membrane is mollification; plastic exudation, hæmorrhage, suppuration, and ulceration being very rare in the first year of life. After this time exudation processes are more numerous, especially fibrinous exudations are not unfrequent. This predisposition of early age to contract diseases of the mucous membrane, is afterward decreasing, is not very common in advanced age, until in senile age it is rather increasing.

A number of diseases of the mucous membrane in early age are of a primary nature, and many of them result from

direct local injuries. It is a singular fact, however, that thorough and deep local injuries, cuts and wounds of any kind of the mucous membrane, dangerous though they look, are attended with very little danger in the majority of cases; they will generally heal readily and lose nothing of their merely local character. Thus foreign bodies entering the substance, combustion destroying the structure of the mucous membrane, although sometimes among the causes of a disease, will not so frequently give rise to a severe affection, as a less serious injury often repeated. Animal or vegetable parasites, and indigestible food, will therefore, as their influence extends over a longer period, although their sudden insult is often but inconsiderable, be among the most frequent diseases of the mucous membrane of the digestive organs. Another very important and frequent cause of diseases of the mucous membrane is refrigeration. We are entitled to state this as a fact, although we do not know whether cold acts by the suppression of cutaneous secretion alone, or by some influence on the peripheric cutaneous nerves and reflex action alone; or by both. It is, however, a fact that especially the mucous membrane of both the respiratory and digestive organs is very subject to the influence of cold, together with the other causes of disease depending on the general condition of the atmosphere, and the changes and general influences of season, of epidemics and endemics.

These latter are of great importance in the etiology of the affections of the mucous membrane in early age; for we know that not only malarious influences and animal effluvia will readily act on the impressible infantile organism, but the constitutional and contagious poisons are mostly observed to produce their peculiar forms of disease in infantile age. Thus children are the majority of patients suffering from eruptive fevers; scarlatina, measles, and diphtheria mostly attacking the infantile organism. And here it is important to state that a peculiar part of the mucous membrane has always a tendency to be affected by a peculiar constitutional poison, both in early and advanced age. Thus diphtheria, scarlatina, syphilis and mercurialism show a predilection for the mucous membrane of the mouth and pharynx, typhus for the ileum, dysentery for the colon, measles and iodism for conjunctivæ and nose. All such affections, although common to every age, are mostly found in the infantile period, the modes of propagation and transmission being eminently distinct at this period of life.

I have frequently alluded to many cases of secondary affections of the mucous membrane; they are the usual results of either local propagation in the continuity of tissue, or of sympathetic spreading. We know from general pathology that there is a direct connection between cutis and mucous membrane, scalp and nose, mamma and uterus, urethra and testicles, and stomach and brain; we need not be astonished then, that there is a contemporaneous affection sometimes of the mucous membrane of the nose and the lungs, the larynx and trachea being free from disease; or of the stomach and colon, the small intestines being not at all affected. And the spreading of affections of the mucous membrane on continuous tissue is so very general, that labular pneumonia, for instance, is in all cases recognized as the termination of a catarrh of the bronchi; and a protracted catarrh of the colon with ulceration of the follicles is known to be a usual consequence of catarrh of the small intestines. Nor is the topical propagation of affections of the cutis over the adjoining mucous membrane an exception, but the rule. The transmission of diphtheritic and other processes of the external integuments of the lips, anus, and pudenda majora, on the mouth, rectum, and vaginia, are frequently observed.

Thus it appears that nothing is more natural than a universal or wide-spreading hyperæmia, changes in both quantity and quality of secretions, rupture of blood-vessels, and even neoplasms. The alterations observed in the secretions are frequently more important in relation to post-mortem epicrises, than the anatomical change of the tissue itself; for you have learned already, from a previous lecture, that not unfrequently no anatomical trace is detected in patients who have died from, or with, hyperæmia of the brain, pharynx, intestines, or cutis. The abnormal secretions are therefore as important elements in regard to the results of post-mortem examination, as they again are ready causes of renewed attacks, from the local irritation depending on their presence on the membrane. The prognosis, therefore, depends greatly on their nature and amount, and frequently as much on them as on the structure of the membrane, its epithelium, follicles, or papillæ. To a great extent they also influence the symptoms, among which functional disorders and anomalous secretions are always prominent. Pain is sometimes observed, but it is frequently indistinct and obscure. Of more importance than the latter, however, are some indirect symptoms, of which reflected motions, and even muscular paralysis, are

frequently met with. Thus, sneezing, coughing, vomiting, and tenesmus are brought on. Disorders in neighboring or distant parts are effected by the suppression of secretion and injection of the tissues; topical spreading on the subjacent submucous tissue, as in œdema of the glottis, and retro-pharyngeal abscess; and participation of the whole system.

After these general remarks you are enabled to trace a direct connection between even the slightest causes and severe affections. I have taken particular pains, in former lectures, to present for your inspection a number of affections which, severe though they be, owe their origin frequently to a comparatively insignificant cause. The greatest stress has been laid by me, further, on the large number of slight or unimportant causes giving rise to affections of the mucous membrane. That in some cases an abnormal process of dentition will prove a source of evil, I do not deny; but from many previous remarks, and from comparison with other causes of diseases, you have arrived at the conclusion that the vast majority of diseases of the mucous membrane allow of another explanation than the blind assumption of the culpability of a physiological process. The great progress of pathalogical anatomy and differential diagnosis ought not to be lost on us. The period, where the diseases of small children consisted in dentition, of advanced ones in worms and scrofula, of adults in rheumatism, scrofula, and syphilis, is past. With sound principles in pathology, and a correct knowledge of pathological anatomy and differential diagnosis, all the different and numerous affections of the mucous membrane; simple injection, with or without extravasation; acute hyperæmia, with increase and alteration of the secretion, and follicular swellings; acute serous or bloody exudations, with more or less severe symptoms; pseudo-membranous deposits of epidemic, cyphilitic, or mercurial character; purulent discharges; ichorous decomposition; chronic alteration of both vascularization and secretion; hæmorrhage; œdema; hypertrophy and whatever changes we have learned to take place in the mucous membrane of all the organs that have been submitted to your attention in previous lectures—will no longer present to you the difficulties of bygone times, nor urge upon you the necessity of resorting to an obscure, generally erroneous and improbable, and almost always unproven explanation.—*Amer. Med. Times.*

ON THE MOLECULAR THEORY OF ORGANIZATION

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Parodying the celebrated expression of Harvey—viz: "Omne animal ex ovo," it has been attempted to formularize the law of development by the expression, "Omnis cellula e cellula," and to maintain "that we must not transfer the seat of real action to any point beyond the cell."* In the attempts which have been made to support this exclusive doctrine, and to give all the tissues and all the vital properties a cell origin, the great importance of the molecular element, it seems to me, has been strangely overlooked. It becomes important, therefore, to show that real action, both physical and vital, may be seated in minute particles, or molecules much smaller than cells, and that we must obtain a knowledge of such action in these molecules if we desire to comprehend the laws of organization. To this end I beg to direct attention—

1st. To a description of the nature and mode of origin of organic molecules.

2nd. To a demonstration of the fact that these molecules possess inherent powers of forces, and are present in all those tissues which manifest vital force.

3rd. To a law which governs the combination, management, and behavior of these molecules during the development of organized tissue.

1. By a *molecule* is to be understood a minute body, seen under high magnifying powers in all organic fluids and textures, varying in size from the four thousandth of an inch down to a scarcely visible point, which may be calculated at much less than the twenty thousandth of an inch in diameter. Optically it is distinguished according to its size, the smallest presenting dark or light points as the focus is changed, and the larger exhibiting a dark or light centre, surrounded by a distinctly-shadowed ring. These last are frequently distinguished by the name of *granules*. The ultimate molecule

* Virchow, English Translation, p. 3.

has never been reached even with the highest magnifying powers. In the same manner that the astronomer with his telescope revolves nebulæ into clusters of stars and sees other nebulæ beyond them, so the histologist with his microscope magnifies molecules into granules and sees further molecules come into view. The chemical composition of these molecules must vary infinitely, but I have been in the habit of classifying them into three groups, and referring them to (1st) the albuminous, (2nd) the fatty, and (3rd) the mineral compounds. These constituents may be mingled together in various proportions so as to produce simple and compound molecules. In the vast majority of cases they are globular in shape, but they may be angular, square, and of various forms. They may differ in size or be of tolerably uniform size in the same liquid or substance. They may be regularly or irregularly diffused in the matter examined. Sometimes they are concentrated in particular places, and at others scattered in groups. Their color is various. Most of the pigments in plants and animals are dependent on the formation of molecules, which in the human lung have been proved to be pure carbon, and in the tissues of plants and animals differently tinted kinds of fat or of wax.

These molecules may be formed in two different ways: 1st, by precipitation in fluids; 2nd, by the disintegration of previously formed tissues. The former may be called *histogenetic* and the latter *histolytic*. They may be denominated molecules of formation and molecules of disintegration.

Histogenetic molecules are formed either from the union of two simple organic fluids, or from precipitations occurring in formative fluids, holding various substances in solution. Fourteen years ago I read to the Royal Society of Edinburgh a paper giving an account of the results obtained by a union of oil and liquid albumen, the two organic fluids from which molecular matter is most commonly derived. It was Dr. Ascherson, of Berlin, who first discovered the important fact, that the mere contact of oil and fluid albumen caused the latter to coagulate in the form of a membrane, which he called the haptogen membrane, from *aptomai*, to come in contact. A more complete mixture of two such drops produces, as is well known, a white opaque fluid or emulsion, which in structure exactly resembles milk. That is to say, surrounded by a layer of membrane of coagulated albumen. Such compound molecules possessing the property of endosmose may therefore readily be produced artificially, and by

trituration can be reduced in size so as to resemble the elementary molecules in chyle or in the yolk of an egg. If oil and albumen be introduced into the stomach and intestinal canal, they are always so reduced; and one of the objects of digestion would appear to be, separating from the food and rendering fluid its oil and albumen, so as to produce the chylemolecules which are ultimately transformed into blood. Indeed, everywhere in living organisms it may be observed that oil and albumen, formed as secretions by plants, and entering the bodies of animals as food, either separately or united, constitute the chief origin of molecular formations.

Mr. Rainey has recently pointed out the condition which causes molecular mineral matter to assume the form of rounded nuclear bodies.* This condition is viscosity. If carbonate of lime be dissolved in water, the forms produced on its precipitation are crystalline; but if the fluid be glutinous—composed, for example, of fluid, gelatine or gum—the forms produced are oval or globular. Precipitations made in this way on slides of glass, closely resemble the appearances called nuclear or cellular in different stages of development. Mr. Rainey has further shown how starch granules are produced in the juices of vegetables by the endosmose of gum into a cell containing a solution of dextrine.† In the same manner that the contact of oil and albumen produces oleo-albuminous molecules, so does the contact of gum and dextrine precipitate starch molecules. In this manner we can comprehend how the mixture of various organic fluids gives rise to particles of different kinds.

Histolytic molecules are the result of the transformation and disintegration of fluid and solid substances by chemical and or mechanical action. They are generally larger in size than histogenetic molecules, are more purely fatty, and, from being associated with the *débris* of broken-down texture, may in most instances be readily distinguished. Thus in the breaking up of cells and of muscles when they become fatty, or in the putrefaction of vegetable or animal matters, these may be seen to soften, lose their peculiar structure, break up, and ultimately be reduced to a molecular condition.

We shall subsequently see that these two kinds of mole-

* On the Mode of Formation of Shells of Animals, of Bone, and of several other structures, by a process of Molecular Coalescence, &c. By Geo. Rainey, M. R. C. S. London, 1855.

† Microscopical Journal, 1859.

cules are constantly changing places; or, in other words, molecular matter formed from the process of integration may, when placed under peculiar circumstances, become the basis of matter which undergoes development. In nature, the breaking down of one substance is the necessary step to the formation of another; and the hystolytic or disintegrative molecules of one period become the histogenetic or formative molecules of another. The fact constitutes the basis of the law which I shall subsequently seek to establish.

II. These molecules are governed by forces, which induce amongst them a variety of movements, and cause them to combine in definite ways. This force, which we may call *molecular force*, is altogether independent of cell, nucleus, or other form of structure.

1st. There are the well known molecular movements described by Robert Brown. These vibratile, circular, serpentine, or irregular motions may be observed whenever molecules are suspended in fluids of certain desitines, but are too well known to require notice here. They occur altogether independent of organized structures, and must be regarded as in their nature purely physical.

2nd. The peculiar movements observed in the interior of cells, vegetables or animal, and during the putrefaction of organic matter. The former are seen in the large vegetable cells of the Chara, Valisneria, and Tradescantia, amongst plants; and those of chyle, the yelk of the egg, and of the salivary cell amongst animals. I have frequently watched the formation of the latter in putrid fluids. A scum, composed of molecules, collects on the surface; gradually several of these unite in minute filaments, more or less long, which assume vibratile or serpentine movements. They are then called *vibriones*. It has been much disputed whether this class of molecular motions be physical or vital.

3rd. The movements, which are unquestionably vital, that occur in the molecules of the yelk, on the entrance into the ovum of the spermatozoid. Here it cannot be maintained that the results are purely physical, because in different ova we see such widely varying effects from apparently the same cause. Neither can it be attributed to any direct influence of the cell or of its nucleus—the germinal vesicle. For example, an egg is fully matured in the female organs of generation, and would prove abortive if a spermatozoid did not find its way through the zona-pellucida and get amongst the mole-

cules of the yelk. As soon as it does so, the apparently purposeless Brunonian movements receive a new impulse and direction. Both spermatozoid and germinal vesicle are dissolved amongst them; and that wonderful phenomenon of the division of the yelk takes place, not by cleavage or other action of the cell-wall or nucleus, but by the separation of the mass into two masses instead of one. This may be compared to what is observable in a dense crowd of men called upon to pass over to the right or left hand in order to settle any disputed question by majority. At first unusual confusion is communicated to the whole; some hurry in one direction, others in another; but, after a time, there is seen at the margins, where the crowd is less dense, a clear space, which gradually approaches the centre, and at length bisecting the whole, produces a complete segregation of the crowd into two portions. So with the molecules of the yelk in the egg after impregnation; their movements are directed by conditions which did not previously exist, and a stimulus is imparted to them which causes the peculiar result. It is the division and subdivision of the yelk, wholly or in part, which produced the germinal mass out of which the embryo is formed, and this not by any direct influence of the cell or nucleus, but in consequence of a power inherent in the molecules themselves, which is communicated to them for a specific purpose.

4th. The peculiar movements so well described by Brucke, Von Wittch, Harless, and especially by Lister, in the pigment-cells of the frog's skin;* and which occasion the sudden change of color in the chameleon, in fishes, and numerous other animals. The black pigment molecules may be diffused throughout the cell or concentrated in a mass, and all kinds of intermediate gradations may exist between diffusion and concentration. The change in color is owing to these alterations in the molecules, the tint being light when they are concentrated, and dark when they are diffused. Mr. Lister ascertained by experiment that their concentration is caused by exposure to light, by death of the animal, and by sudden section of the nerve going to the skin; while darkness and irritation of the nerve or skin causes diffusion. Sudden amputation of the limb produced at first diffusion, followed by the concentration of death. These movements of the pigment molecules are peculiarly vital, and altogether indepen-

* On the Cutaneous Pigmentary System of the Frog.—Philosophical Transactions, 1858

dent of the cell-wall or nucleus. The cell-wall is stationary, and acts only as a sac or investing membrane around the moving particles, while the concentrations of these about the nucleus is purely accidental, and frequently occurs in other parts of the cell. I have seen these molecules myself, as Mr. Lister describes them, streaming out to, and returning from, the circumference, under the influence of the stimuli referred to, where no cell nor nuclear action could be thought of.

5th. There are many other kinds of movements which are evidently independent of cells—for example, those of cilia and of spermatozoids. The former are outside cells, and the latter only move when they are liberated from the cells. The contractile fibrillæ of the muscle are evidently not dependent for their inherent powers on cells or other form of structure, but on the square-shaped molecules of which its substance is composed. All these phenomena, therefore, are connected with the molecules themselves; the force occasioning them is a molecular force, and has nothing to do with pre-existing cells, or supposed germinal centres, as some have imagined.

Again, the power of combination between these molecules, which, under peculiar conditions, not only move, but so move as to advance towards and press upon each other, that they at length unite and produce higher forms, must also be attributed to a molecular force operating in obedience to fixed laws. Thus it was demonstrated by Newton, that in a sphere the total attraction resulting from the particular attrantion of all its competent parts is, as regards any body drawn towards it, the same as if they had been concentrated at the centre. Hence minute spherical particles, as so many gravitating points, will be drawn towards each other with a force varying inversely as the squares of the distances between their respective centres. I may here refer to the able descriptions of Mr. Rainey,* as to the physical laws regulating the formation and disintegration of bodies by molecular attraction and repulsion as well as to the effects of molecular superposition, showing that the same physical power which leads to the formation of these artificial bodies, when long continued, causes their disintegration and destruction. All these changes occur slowly, and require time; but their contemplation, when regarded as purely physical phenomena, must strike us with surprise, as being closely allied to all our conceptions of the progress of life itself.

* *Op. cit.* See also papers in the Microscopical Journal, 1860.

In making use of the expression *life* and *vital action*, I am only using terms to indicate phenomena which, in the present state of science, cannot be accounted for by the ordinary laws of physics. Or it might be said that certain actions are directed and governed by conditions which are as yet undetermined, but which, as they only occur in organic, as distinguished from inorganic bodies, constitute vital actions. Not that an organized body is independent of physical forces, but that certain directions are communicated to them, which, as invariably resulting in specific forms or properties, make up the sum of what we call vitality.

Hence, although we see molecules combining in the forms of crystals and nucleated sperules, inasmuch as we have discovered the physical conditions on which they depend, and can produce them artificially, we have no difficulty in classifying these amongst purely physical phenomena, even when they occur in the interior of animals. But when other molecules unite to form nuclei, cells, and fibres, and these arrange themselves into tissues and organs to produce plants and animals, we are ignorant of the conditions by which these results are brought about—we cannot imitate them artificially, and are content to cal them vital. But the fact I am anxious to point out is this, that so far as observations and research have enabled us to investigate this difficult matter, it appears that the formations and disintegration of vegetables and animals, as well as the peculiar properties they exhibit, are essentially connected with the molecular element. Thus, when we investigate the functions of plants and animals—for example, generation, nutrition, secretion, metion, and sensation —we find them all necessarily dependent on the permanent existence and constant formation of molecules.

Thus generation, both in plants and animals, is accomplished by the union of certain molecular particles called the male and female elements of reproduction. Amongst the Protophyta, the conjugation of two cells enables their contents, or the endochrome, to mix together. This endochrome is a mass of colored molecules, and the union of two such masses constitutes the essential part of the generative act. In the Cryptogamia, a vibratile antheroid particle enters a germ-cell, and finds this last filled with a mass of molecules, which, on receiving the stimulus it imparts, assumes the power of growth. It is the same amongst the Phanerogamia when the germ-cell is impregnated by the pollen tube. In all these cases it is necessary to remember that the protoplasm is a mass of mole-

cules; that a spore is another mass of molecules; that sporules are molecules; that antherozoids are only molecules with vibratile appendages; and that the so-called germinal matter of the ovule is also nothing but a mass of molecules. Cell-forms are subsequent processes, and once produced may multiply endogenously, by germination or cleavage; all that is here contended for is, that the primary form is molecular, and that the force producing action in it is a molecular force.

In animals, as in vegetables, every primary act of generation is brought about by the agency of molecules. The Protozoa entirely consist of mere molecular gelatiniform masses, in which it has never been pretended that a cell-wall or central cell exists. And yet such masses have the power of independent motion, and of multiplying by gemmation. Considerable discussion has occurred as to whether, amongst Infusorians, there is a union of sexes or a conjugation similar to what occurs amongst the Protophyta; but in either case it is by molecular fusion that the end is accomplished. In the higher classes of animals there are male elements, consisting of molecules, generally with, but sometimes destitute of, vibratile filaments; and female elements, composed of the yelk within the ovum, containing a germinal vesicle or included cell. Both spermatozoid and germinal vesicle are dissolved in the molecules of the yelk, which then, either wholly or in part, by successive divisions and transformations, constitute a germinal mass out of which the embryo is formed. Here, as in plants, it is necessary to remember that the spermatozoids, the yelk, and the germinal mass are all composed of molecules, and that these, combining together, form the nuclei, cells, fibres, and membranes which build up the tissues and organs of the organism. It is not from either the male or the female element that the embryo is formed. The supporters of an exclusive cell doctrine have endeavored to show that there is always a direct descent either from the wall of the ovum or from the germinal vesicle as its nucleus. Thus some consider that the vitelline membrane sends in partitions to divide the yelk mechanically. Others have formed the idea that the germinal visicle bursts, and that its included granules constitute the germs of those cells which subsequently form in the germinal mass. Others, again, suppose that on impregnation the germinal vesicle divides first, and that the molecules of the yelk are attracted round the two centres so formed. But numerous observations have satisfied me that both spermatozoid and germinal vesicle are simply dissolved

amongst the molecules of the yelk, from the substance of which, stimulated and modified by the mixture so occasioned, the embryo is formed; a view which has further the merit of explaining what is known of the qualities of both parents observable in the offspring. I am only acquainted with one exception to this general law—namely, the development of *Pyrozoma*, recently described by Mr. Huxley, the description of which, however, is incomplete.* The truth appears to be, that in an analogous manner to that in which the pigment molecules of the skin are stimulated by the access of light to enter into certain vital combinations with one another, so are molecules of the yelk stimulated by the access of the spermatozoid to produce those other vital combinations that result in a new being. The essential action is not so much connected, as has hitherto been supposed, with the cell-wall or nucleus, as with the molecular element of the ovum.

With regard to nutrition—food and all assimilable material must be reduced in the first instance to the molecular form, while the fluid from which the blood is prepared—chyle—is essentially molecular. Most of the secretions originate in the effusion of a fluid into the grand-follicle, which becomes molecular and gives rise to cell formation. In muscle, the power of contractility is inherently associated with the ultimate molecules of which the fasciclus is composed; and, lastly, the gray matter of the sensory, ganglia and of the brain, which furnishes the conditions necessary for the exercise of secretion, and of even intellect itself, is associated with layers of molecules, which are unquestionably active in producing the various modifications of nervous force. These molecules are constant and permanent as an integral part of these tissues, as much as cells and fibres are essential parts of others, and their function is not transitory, but essential to the organs to which they belong.

All these facts point to the conclusion that vital action, so far from being exclusively seated in cells, is also intimately associated with the elementary molecules of the organism.

III. This leads me, in the third place, to an enunciation of the molecular law of growth, which a study of the numerous facts previously referred to has induced me to frame—viz: *That the development and growth of organic tissues are primarily owing to the successive formation of histogenetic and histolytic molecules.* We have already seen that development

* Annals of Natural History, Jan. 1860, p. 35.

and growth in animals originate in the molecules of the yelk of the egg, or of a germinal molecular mass formed from it. From numerous careful researches recognized by scientific men as giving a correct account of the development of various animals and textures, it would appear that the first form is molecular; that the moleculss unite to produce nuclei and cells; that these become disintegrated to produce a secondary mass of molecules; that these again unite to form secondary nuclei and cells; and that the same process is repeated more or less often in various developments, until the animal or tissue is formed. This constitutes the successive histogenetic and histolytic molecules observable in the process of growth —the former building up, to a certain extent, and the product disintegrating to produce the latter, which after a time, again, rearranges itself and becomes histogenetic to form cells or tissues, which in their turn break down and become histolytic. In short, not only development, but growth and secretion, absorption and excretion, are only different names given to histogenetic and histolytic processes, and these are brought about by formative and disintegrated molecules. As illustrations of this law, I may refer to the development of *Ascarix mistax*, as described by Nelson,* and of the process of nutrition in the human body.

In this, and a vast number of similar observations, it must be evident that a certain series of molecular transformations is necessary for the one which follows it. Thereby is produced a continual elaboration of matter,—a constant chemical and morphological series of changes,—the exact number and order of which, in the production of organic forms, only require time and perseverance to discover. Doubtless various conditions, dynamical, chemical and vital, must co-operate in producing the result, and they must all influence molecular as well as every other kind of combination. Such considerations and facts must convince us of the error of endeavoring to place the source of special vital action in any particular form or arrangement of organic matter, whether fibre, cell, nucleus, or molecule. Each and all of these elements have their vital endowments, which re-operate on the others. But, inasmuch as the molecular element is the first as well as the last form which organized matter assumes, it must constitute the principal foundation of organization itself.

It is not my object, in directing attention to a molecular

* Philosophical Transactions, 1850, plates xxviii, xxix, figs. 50, 68, 70, 78.

theory of organization, to interfere in any way with the well observed facts on which physiologists have based what has been called the cell-theory of growth. True, this last will require modification, in so far as unknown processes of growth have been hypothetically ascribed to the direct metamorphosis of cell-elements. But a cell once formed may produce other cells by buds, by division, or by proliferation, without a new act of generation, in the same manner that many plants and animals do; and this fact comprehends most of the admitted observations having reference to the cell doctrine. The molecular, therefore, is no way opposed to a true cell-theory of growth, but constitutes a wider generalization and a broader basis for its operations. Neither does it give any countenance to the doctrine of equivocal or spontaneous generation. It is not a fortuitous concourse of molecules that can give rise to a plant or animal, but only such a molecular mass as descends from parents, and receives the appropriate stimulus to act in certain directions.

In conclusion, the theory I have endeavored to establish on histological and physiological grounds is fully supported by all the known facts of disease and of morbid growths, which further serve to show that pathology, so far from being cellular, is, in truth, molecular.—*London Lancet.*

ON THE MODE OF ACTION OF ALCOHOL IN THE TREATMENT OF DISEASE.

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The subject to which I propose to direct attention is one which for some time past has excited an unusual amount of professional interest, and has led to some angry discussion. Its importance cannot well be exaggerated, since in the quantities which alcohol has of late years been administered in diseases, this agent must be powerful for good or evil; and the more so now that the plan, having passed out of the hands of him who introduced it, may not unlikely be adopted by many of his pupils and admirers, who have not so large an experience or so well-informed a sense of discrimination. But, whilst impressed with these facts, my object now is not

principally to keep up the present controversy, but, since additional information on the subject has been recently obtained, to discuss its merits on scientific grounds, and to remove it further from the domain of hypothesis and empiricism. I wish to show what is the true action of alcohol, and thence the general conditions of system to which it is fitted, rather than to discuss minutely the specific diseases in which it may be employed. The same conditions exist in some stages of many diseases, and hence it is better to confine our attention to the separate indications for its use, than to regard the whole phenomena of a disease as a unity, to be treated on a uniform plan. The indications being given, it will be easy to specify the diseases and stages of diseases to which its action is suitable.

In adducing the proofs of the action of alcohol in diseases to which it is suitable, I presume we are entitled to cite its action in health; for whilst the *degree* of action in the former may be different from that in the latter, the *direction* of its action must be the same in both. The indications for its use in disease can never be opposed to its indications in health, but tolerance of its action may be very different in the two conditions. This is an important consideration; for whilst we have much proof of its action in health, we have very little, indeed, in disease. At present we only seek for its mode, and not its degree of action.

The knowledge of its action in health may be sought for from two sources; that which is readily cognisant to the senses, and that from scientific research. The former source of information is perhaps more valuable in this than in any similar inquiry, for the universal employment of alcohols and their decided effects render them objects of popular observation.

The Brain.—Alcohols, in moderate quantity, are popularly known to excite the spirits, and to quicken certain qualities of the mind, but to lessen the power of concentration and the clearness of thought; and, when taken in larger quantities, to disturb the harmony of the mental actions so as to render the person furious and ungovernable, to lesson the power of perception and sensibility, and ultimately to produce coma.

The Skin and Heart.—They also make the hands and face red, hot, and swollen, and increase the force of the heart's action. The skin is commonly dry as well as hot.

Heat.—They yield a pleasant warmth to the stomach and alimentary canal, and the more so when the skin is cold.

The Muscles.—The muscular force seems at first sometimes to be increased, for a man in his fury can exert unwonted strength; but this is only in appearance, and commonly there is less disposition to move, and less power of co-ordinating the muscles; whilst relaxation of the features exists, and ultimately there is inability to move.

The Kidneys.—In some persons there is diuresis, whether from increased secretion of urine or from lessened power of the sphincter.

The Lungs.—The breathing in approaching coma is feeble, labored or irregular.

These effects are temporary, enduring two or three hours; and after the excitement there are, in very varying degrees, depression of the spirits and general lassitude, mental prostration, dry furred tongue, unpleasant taste, headache, derangement of digestion, and loss of appetite. Soda-water and brandy in the morning are as refreshing to some persons after as the wine or spirit was pleasant during the debauch.

Persons vary very much as to the amount of alcohol which they can take, and as to its effect upon the skin and kidneys; but, as a rule, one who perspires and passes urine freely can take the larger quantity. A degree of training is also necessary, so that persons become accustomed to the use of alcohol—that is to say, they gain some power of adaptation of the system to its presence. Alcohol-drinkers in excess are known to be unhealthy, and not equal to others in mental or physical power. They also suffer from loss of appetite, deficient assimilation, and local effects on the brain, stomach, liver and kidneys. Ale-drinkers are more subject to inflammation than spirit-drinkers. Such are popular observations.

In a prolonged inquiry upon myself and another, we took the alcohols in moderate quantity, duly diluted, on an empty stomach, in the morning and during rest; and we also noticed most carefully the general effects, and the moment of their occurrence. The parts of the system influenced by the alcohols, and the order of the occurrence of their symptoms, were as follows:

1. Upon the heart, and doubtless from the local action of the alcohol.
2. Upon the brain, as shown by the consciousness, mental and sensual perceptions.
3. Upon the cerebro-spinal tract, as shown by the muscular system, and upon the reflex function of the spinal cord.
4. Upon the respiratory tract.

5. Upon the sympathetic system; but as it is not possible to show the moment when the secretion of urine, for example, is interferred with, it may be that this should have had an earlier place in this order of sequence.

The details of these actions and the period of their occurrence may be thus epitomized, it being borne in mind that the experiments were made in the morning during fasting:

(*a*) In from two to eight minutes a sensation of fullness at the crown and the back part of the head, or at the temples, according to the kind of spirit taken. This was due, doubtless, in great part, to the increased force of the heart.

(*b*) In from two to seven minutes the mind was disturbed. Consciousness, the power of fixing the attention, the perception of light, and we believe of sound also, was lessened; the power of directing and co-ordinating the muscles was also lessened, while there was a very marked, peculiar, continuous, purring or thrilling, and not unpleasant sensation, passing from above downwards through the whole system. This latter symptom was the most pronounced in from fifteen to forty minutes, and continued, without much variation, during 20 to 30 minutes. After this period, the whole effect recorded under this head diminished, and oftentimes suddenly, as was shown by the increased perception of light, as if a veil had fallen from the eyes, and by increased consciousness; but, nevertheless, the last power to be *completely* regained was consciousness.

(*c*) The increase in the action of the heart set in as soon as three minutes, and continued from thirty to fifty minutes.

(*d*) Coincident with this increase was a sense of dryness, heat, and evident fullness or swelling of the exposed parts of the skin, as the hands and face, and also a general sensation of heat. This was due to the increased supply of blood to the surface, and the lessened refrigeration of the skin. This increased for a time, and so much so, that, with rum especially, the skin was as harsh and dry as when exposed to an easterly wind. After about twenty to forty minutes, this sensation of heat gave place to one of cold, which was first felt on the most sensitive part of the body with regard to temperature, viz., between the shoulders, and at length, notwithstanding the existence of a suitable degree of atmospheric temperature, it became distressing, and led even to shivering. This was sometimes so marked, and occurred so suddenly, that it gave rise to a shock. It did not correspond with the temperature of the skin, but it was usually co-existent with the cessation of the increase of the heart's action.

(*e*) The muscular system was influenced in a marked and definite manner. The action on the involuntary muscular fibres of the heart has already been mentioned. The thin layers of voluntary muscles found about the body showed great relaxation. The respiratory muscles acted in a gasping manner, so that there was a pumping and quick respiratory effort in the later stage. At all periods there was a sense of impediment to respiration. The muscles of the limbs were inactive. There was relaxation of the muscles, and stiffness of the skin of the face, forehead, and upper lip, so that the features fell. This state of the muscular system followed the commencement of the effect upon the consciousness, and other functions of the brain, and also the excited state of the heart. In reference to its cessation, the power of co-ordinating the muscles was first regained, whilst the buzzing sensation and semi-cataleptic state continued, and the disposition to use the muscles was regained last of all. There was so close a connection between the nervous and the muscular systems, and complete consciousness is so essential in inquiries of this kind, that it is not easy to isolate the effect upon the muscles; but close attention to all the phenomena, the care to note them down at the moment of their occurrence, and the long series of experiments that we have made, assures us that the muscular tone and power are greatly lessened; that the effect is not identical upon voluntary and involuntary muscles, and that it is not even identical upon the inspiratory and expiratory set of muscles.

(*f*) The effect upon the mind is also very marked and peculiar, and would have been a very valuable study to a psychologist in search of facts. Rum and some other spirits made us very hilarious and talkative in about ten minutes, and during about twenty to twenty-five minutes; so much so, that my friend was almost a king; but as minutes flew away, so did our joyousness, and little by little we lessened our garrulity, and felt less happy, until at length, having gone down by degrees, we became silent, almost morose, and extremely miserable. Then, indeed, we felt the horrors and the sorrows of the drunkards lot, snd saw, with a clearness that can only be perceived by such experience, how certain it is that he must again drain the intoxicating cup. Never were the extremes of happiness and misery brought so vividly before us, or seemed to be in such close poximity, as on those occasions, and never did we so deeply commisserate the

slavish, miserable, and almost hopeless condition of the poor wretch who has become a victim to this fearful vice.

In addition to the above, we may mention that every mental perception was darkened, and that the dreaminess, which is not an unpleasant feature of it, is a condition in which neither thought nor imagination acquires power. We suspect very greatly the statements of those who profess that fancy is then on her most airy wing, or that thoughts spring forth without the efforts of parturition, and our most charitable reply to such statements would be, that it is all a dream.

(*g*) The effect upon the secretions was very marked, and, in addition to its varying effect upon the urine, it is certain that the secretion of the salivary glands and of the mucous membranes was lessened, as was shown by the dry state of the mouth, and by the sore and dry condition of the tip of the tongue, which was so often present when the rum was taken.

(*h*) The duration of the influence was varied somewhat, both with the substance taken, (being usually longer with rum, and shorter with gin,) and with the season of the year. In the spring time, it passed away within an hour and a half or two hours; but at other times the system continued to be disturbed, and we were depressed during the whole morning.

In a further inquiry which I have recently made in one of our prisons, I found that when a small quantity (half an ounce of alcohol) had been given four times a day to prisoners who labored at the treadwheel, it produced lassitude, thirst, and great diminution in the amount of urine. The prisoners remarked that they felt lazy and unfit to do their work, and slept more soundly at night.

Thus, the effect of alcohol, as shown by common observation, both of a general and precise kind, seems to show—

1. That the spirits may be excited, but all the functions of the brain are lessened or disturbed. The spirits are not the result solely of the action of the brain.
2. Muscular power is lessened.
3. The secretions of the salivary glands and mucous membrane, and, perhaps, of other organs are lessened.
4. The action of the skin is lessened.
5. The action of the heart is increased in force.
6. There is increased sensation of heat, due chiefly to the larger distribution of blood to the skin, (the organ of sensation of temperature,) and to the diminution of the loss of heat by diminished evaporation from the skin—a diminution not prevented by an increase in the loss of heat by radiation.

7. The sensation of cold in the reaction seems to be due quite as much to disturbed sensitiveness of the nervous system of the skin as to a withdrawal of the increase of the supply of blood to the skin, for it was far more severe than the external temperature warranted.

SCIENTIFIC RESEARCHES.

We may now turn to scientific research. The inquiries have been very numerous, but I will select Hammond as their type, because whilst his results have much corresponded with those of the other observers of his period, they are all liable to the same kinds of objection.

As to the influence of alcohols upon the respiration and the *heat-forming* function:

To chemists we owe the statement that alcohol aids in the heat-forming function of the body, because it is an hydrocarbon; and that it is transformed in the system, and eliminated as a carbonic acid and water, it must yield heat in these transformations. Hammond and all others found that alcohol lessened the quantity of carbonic acid expired, but no one has pointed out the inconsistency of this statement with the chemical view to which all these observers have given their adhesion—viz: that alcohol is resolved into carbonic acid, which must pass out by the lungs, and thereby increase the evolution of carbon. Lallemand, to whom we shall refer presently, when denying the transformation of the alcohol, says that he does not understand how alcohols lessen the excretion of carbonic acid, but upon this point he had not experimented.

Now see the objections which may be fairly raised to the experiments from which these results have been obtained:

1. Hammond collected the quantity for one minute three times a day, and thence inferred the total quantity in the twenty-four hours. This evil is also found in most other experiments, as those of Prout, Vierordt, Coathupe, Bocker, and others.

2. Hammond assumed that he ordinarily inspired 14 times a minute in health, and during all his experiments he did the same, and tried to inspire the same quantity as in health. Hence, at the most he could only have sought for the per centage of the carbonic acid in the expired air, and not the total quantity evolved in a given time; but the attempt to voluntarily limit the respiration deprives the whole process of value. Prout also sought only by the per centage amount. Further,

Hammond expired *through* a volume of solution of baryta, and thereby placed a weight upon his expiration, which would either prevent the completeness of the act when the respiratory power became feeble at the end of expiration, or it would demand an unusual force in expiration, which no man can so measure as to make the result correspond with free respiration.

3. The influence of other food was assumed to be the same from day to day, because the same amount of food was taken, and the same exertion made, and, moreover, it was supposed to be the same at the three particular minutes at which the carbonic acid was collected; but this is quite a fallacy, as we have shown in the hourly variations in the evolution of carboni acid. ("Philosophical Transactions," 1859.) The same admixture of other unknown influences from food, and the same want of knowledge (the knowledge did not then exist) of the natural variation in the amount of carbonic acid evolved at the various hours of the day, and of the variations from day to day, apply also to the experiments of Vierordt, Bocker, Coathupe, and other observers. Hence the liability to error in inferring large from very small quantities, and in assuming that conditions are constant whilst they are most variable, lessens vastly the reliability of the results obtained. To this might be added, in reference to Hammond's experiments, the imperfection of his apparatus; for it is quite certain that a tube of chloride of calcium would not absorb all the vapor from the breath during the act of breathing, and, also, that he ought to have appended a desiccator, through which the air should pass after the partially dried air had passed through the solution of baryta.

The results of my experiments have not entirely corresponded with those now referred to; but having collected the carbonic acid for five or ten minutes at a time every fifteen minutes during the action of the alcohol, with the expiration quite free; having maintained a uniform state of rest; having experimented in the absence of food or any other cause of disturbance, and having taken one moderate dose at each experiment, it is hoped that the nearest approach to the true action of alcohol has been made. Moreover, the number and extent of the experiments far exceed those which all previous observers have recorded. For the description of the method and apparatus employed, as well as the details of the experiments, I must refer to the "Philosophical Transactions" for 1859.

Alcohol, in every dose up to the usual one in taking spirits and water, increased the amount of carbonic acid evolved, but not with the uniformity of a food, nor to a greater average extent than one-eighth to half a grain per minute. The effect was much more sustained when a small dose, as half an ounce was repeated every quarter of an hour. Prout, and all observers, have noticed the want of precise uniformity in the action of alcohol.

Rum increased it somewhat more, and on some occasions much more. It is a spirit which is colored with burnt sugar, and we have proved that sugar very largely increases the evolutions of carbonic acid, but the cause of the increase has not been established.

Whiskey varied according to the sample.

Brandy and gin (both good, the former foreign and the latter unsweetened) lessened the quantity of carbonic acid evolved to a moderate extent generally, but sometimes gin caused great depression.

The duration of this action was from one to two hours.

The volatile oils and ethers which give character to the various wines and spirits, always, when inhaled, lessened the quantity of carbonic acid and vapor exhaled; and this was the greatest when the aromas were the best—viz: in old and fine wines and spirits. This result was without an exception. The effect of fusil oil, and other unknown compounds which cause headache, was not separately determined.

With all these substances there was variation in the effect, both in the same and different persons, and we characterized them as disturbers of the system.

Ales always increased the amount of carbonic acid evolved, to an average degree of a half to one grain per minute, and through a duration of two hours. They contain, besides alcohol, sugar, nitrogenous matter, and volatile aromas, and to the two former this effect must be attributed.

Rum and milk had a very similar, but greater and more sustained action.

Here I venture to affirm that alcohol, as a general stimulant, slightly increases the vital action of respiration; that gluten and sugar do so more largely; and that the aromas and probably the fusil oil and other injurious ingredients of bad spirit lessen these changes.

Now, in reference to the *flesh-forming* or the nitrogenous process. I do not stop to show that the term "flesh-forming" is derived from the supposed action of nitrogenous matter, as

the waste of flesh is supposed to be indicated by the evolution of nitrogen; but it can be readily shown that urea may proceed either from the tissues, from the transformed food, and cannot therefore at present be regarded as indicating one or other separately.

Hammond showed that alcohol greatly lessened the excretion of urea, and in this he is supported by all observers. But mark the attendant circumstances, as showing the cause for this diminution. He says: "Whilst these experiments were progressing, the healthy action of my system was much disordered. Headache was constant, sleep was disturbed, the skin was hot, pulse full and bounding, averaging 98 per minute; and there was on two occasions after eating slight palpitation of the heart. My appetite was capricious; sometimes disgust was created by the mere sight of food, at other times I ate with a good deal of relish. I should think I should have been seriously ill if I had continued the investigation longer."

Hence it is quite certain that, whatever might have been the physiological effects of the alcohol, they were those of disease, and not of health; and that, although he ate from sixteen to twenty ounces of meat and other food proportionately daily, there was most marked disturbance of the assimilative function. With a large dietary he was ill-nourished, and hence, with lessened transformation of food there was a lessened amount of urea evolved. This is further proved by a reference to his statement that he gained weight (as confirming his view of the power of alcohols to retard waste,) for there was a gradual accumulation of fæces, as was shown by his statement: "This fortunate termination was probably promoted by a diarhœa, of considerable violence, which commenced on the second day after the conclusion of these experiments, and continued forty-eight hours." Moreover, I have proved that the system varies greatly in the amount of fluid which it appropriates, and that with alcohols taken daily, the amount of urine is lessened, and the system has acquired an increased power to accumulate food. This accumulation, like that of fæces, is, however, temporary, and, with elimination of it, all unpleasant symptoms pass away. In our experiments in prisons, we found that in all the four men the quantity of urea evolved was greatly lessened on the first and second day, but on the third day it was almost restored. During this period of retention, the body would gain weight, quite as great in extent as that proved by Hammond, but it would be no proof of diminished waste of tissue.

It may be properly objected, that the above mentioned statement of Hammond, as to the influence of alcohol upon his health, only refers to the two series of experiments in which he ate his ordinary amount, and an excessive amount of food, and that he found no such results to follow its employment when he ate a deficiency of food. This is true; but it does not affect the conclusion at which he arrives, viz., that the alcohol arrested waste of tissue, because, whilst the lost weight daily before he took the alcohol, he ceased to do so when alcohol was added to his diet, and at the same time the amount of urea was diminished. Let us for a moment see what value ought to be attached to this statement.

Before the experiment began, on an average of five days, his weight was 225-97 lbs., and the daily weights of the fæces and urine were 6 oz. and 41-29 oz. At the end of the experiment, on the average of five days, he had lost, as compared with the previous five days, 47 lbs. in weight, and the daily weight of his fæces and urine was lessened by -19 oz. and 1.37 oz. The whole question rests upon the fact of there being an arrest of the waste previously going on during the 5 days before the alcohol was taken, and a positive average gain of 0-3 lb. in the weight of a man weighing upwards of fifteen stone as compared with the weight in a single day immediately preceding the experiment. Is it not absurd to attach any value to so small a change, and particularly when we bear in mind the defects of ordinary balances to weigh 226 lbs., the errors of weighing, and the variation of excretion remaining within the body? But let us admit it all, and what is it worth? He gained in weight -16 lb. on the average of five days, whilst the retention of fluid per day in the urine during the five days was, on the average, -74 oz, and that of the fæces -25, or a total retention of excretions of 4-9 oz., from which he ought to have gained much more than he did gain. That these excretions were retained, and were subsequently emitted, is proved by the results of his own and of our experiments. Hence, he gained in weight by the temporary retention of urine and excretion, and not by any increase in the tissue of the body, and the whole supposed value of the experiment and the deductions therefrom is taken away.

Hammond further states, that the perspiration did not appear to be lessened under a temperature of 73° in the shade; but he did not make any experiments in reference to it, and referred only to the evident perspiration. Other experimenters, both upon men and animals, have found the skin unusually dry and harsh.

To these various scientific researches, we will add those of MM. Lallemand, Perrin and Duroy, who have just shown that when a moderate dose of alcohol has been taken, either by a man or dog, the alcohol can be found in the expiration, the perspiration, and the urine for at least eight hours afterwards. They have not collected the alcohol, but they have shown its presence by its action upon the bichromate of potass in sulphuric acid, and have proved that this action is not produced by the allied substance aldehyde. They affirm, therefore, that alcohol is not transformed in the system, but passes off the body unchanged; and the fact that alcohol is found in the brain for a period of seventeen, and it said for thirty-six hours, strengthens their belief. I have carefully repeated their experiments, and have shown on several public occasions, the reaction of alcohol on the breath for four hours after an ounce and a half has been taken. In the case of the skin, M. Lallemand proved the secretion of alcohol, by enclosing an Italian greyhound in a glass case, and passing a current of air over it and through the test; but I have proved its presence in the vapor passing off from so small a part of the body as the arm, and even the hand only, of man. In repeating this latter experiment, sheet caoutchouc must not be used, neither must the containing bag or vessels be employed a second time without having been well cleansed from the alcohol which was left from the former experiment. It will also be more efficiently performed in those persons who perspire freely; for it is highly probable, that whilst alcohol may in all persons pass out of the body by all the above mentioned outlets, it will chiefly select that excretion in each individual which is most free. As, for example, the breath in those who make much exertion, or in cold; the skin in those who perspire freely, and in warm weather; and the kidneys in others. The test is prepared by carefully dissolving one part of bichromate of potash in 300 parts of strong pure sulphuric acid, and it is used by passing the breath through absut a drachm of it placed at the bottom of a tube six or eight inches long. The cherry red color is changed to emerald green.

Thus we are led to the following summary of the mode of action of alcohol:

1st. The action of the heart is reinforced, and by it the fullness and freeness of the circulation are maintained, and the blood carried to the remote parts and to the surface. The tendency to accumulate fluid increases the fullness of the bloodvessels.

2d. The action of the skin is lessened, whereby the loss of heat is reduced, the urgent necessity for food and vital transformation is lessened, and the sensation of warmth is increased. The local action upon the stomach and alimentary canal is that of a stimulant, and increases vascular action and warmth. These are the common and general actions of alcohols; but in some persons the skin acts more freely than in others.

3d. Alcohol is probably not transformed, and does not increase the production of heat by its own chemical action, but indirectly, as above mentioned, and by a general temporary increase in the vital actions. Its action upon the respiration is not its important action.

4th. It interferes with alimentation, and causes the retention of water, and thereby lessens the excretion of urea; and if it lessens muscular waste (which it has not been proved to do), it must be by lessening vital action. Its power to lessen salivary secretion must impede the due digestion of starch. The diminution in the elimination is due in part, as just mentioned, to the excretion of urine by the kidneys.

5th. It lessens muscular power, and the production of certain secretions.

6th. There is no evidence that it increases nervous influence, except the action of the heart and elevation of the spirits be regarded as such; whilst there is much evidence that it lessens the nervous power, as shown by the mind and the muscles.

7th. It varies the balance of the circulation at the centres and the superfices, and interferes with the production of heat.

8th. It has two sets of actions.

9th. The system acquires an adapting power more or less easily and perfectly, and hence alcohols differ sometimes in their action in different persons.

10th. There are other important elements in ales, wines and spirits, having a different and independent action; so that old wines directly lessen vital action, and ales directly promote transformation of food.

The dose influences the phenomena of the action of alcohol, but only in degree, although it is common to consider the action to differ in doses which are called moderate and excessive respectively, the former being stimulating, and the latter exhausting. So far as the direct action upon the mind with its intellectual and sensual perceptions, upon the muscles, and upon the respiration is concerned, we could not see any difference in effect but one of degree; and, doubtless, in indir-

ect effect, that dose which most powerfully acts upon the system directly will be the most likely, by the disturbance of the functions of the system, to produce indirect effects which will tend towards disease.

For all medicinal and dietetic purposes, I venture to affirm that the dose only affects the degree, and not the direction of the influence.

Having thus established the foregoing facts, I proceed to consider the views of the late Dr. Todd on the therapeutic action of alcohols, as contained in his well known lecture on that subject, and to see how far they may be supported by the present state of science. His views are based upon the chemical theory that alcohol is transformed within the system, and produces heat, and the following is a summary of his remarks:

1. Alcohol acts primarily on the nervous system, and, like other hydro-carbons, but in a greater degree, has great affinity for the nervous system.

2. It acts in two degrees: one beneficially, when it augments the generation of nervous power; and the other injuriously, by deteriorating, impairing or destroying the nutrition of nerve matter. In the first degree, and when it acts beneficially, there is no smell of alcohol in the breath; but in the latter or when the dose is too large, the odor is perceptible.

3. There is no true secondary depression of the vital powers, except when the quantity is too large, and then it acts by deranging the digestive functions.

4. Alcohol does not, in any dose, produce inflammation of the lungs, heart or liver. The brain symptoms do not show congestion or inflammation, but a poisoning of the nerve-cell and nerve-fibre.

5. When carefully taken, it upholds the calorifying process, strengthens the action of the heart, and reduces the frequency of the pulse. By upholding the calorifacient process, it prevents oxydation of the nervous and other tissues.

6. It is simply absorbed into the circulatory system; but oil (another hydro-carbon) has a more complicated digestion, and therefore alcohol acts more quickly and certainly.

7. The dose should be from two drachms to two ounces, and repeated as frequently as food would be given, and with the same intention—viz, to save tissues from oxydation. The dose and the frequency should be adhered to.

8. The general use of alcohols shows an instinct in man for them, and in recovery from disease they uphold nervous force and supply the most assimilable material for combustion. They calm the nervous system and avert delirium

9. It is very dangerous to withdraw the alcohol, but the signs which would sanction this are referable to deranged digestion—as flatulus, eructations, sickness, and dry tongue and mouth; and also the smell of the breath which implies that the alcohol is passing off unchanged. Coma and delirium from excess of alcohol rather indicate that more alcohol should be given.

Such is a summary of Dr. Todd's views, and they chiefly include the belief that alcohol increases nerve-nutrition, strengthens the heart's action, lessens the rapidity of the circulation, shields the tissues from oxydation, and produces heat; and the sign which measures the efficiency of it is the non-existence of the odor in the breath. As to the skin, he merely remarks that when alcohol is given to a patient who has a hot skin and a rapid pulse, it may look like an illustration of the dogma, "Similia similibus curantur." In reference to all his inferences from the supposed transformation of alcohol in the system, we may remark that they are of no value if it be shown that this transformation does not occur, but that alcohol, after remaining in the system for a time, and disturbing its action, is ejected still as alcohol. I believe that the latter is almost if not quite certain.

I see no ground whatever for the statement that hydrocarbons have an especial affinity for the nervous system, taking starch and oils as the representative of this class, and Dr. Todd does not adduce any. Neither has it been in any way proved that alcohols improve the nutrition of the nerve cell and fibre in any separate and special way, but only by improving the whole nutrition of the body. Indeed, the phenomena of nutrition lead our attention away from mere local actions as independent conditions, and teach us that it is a general and not a local act. All the phenomena attending upon alcohols when taken in quantities which may render their effects noticeable, evince great nervous disturbance; and I cannot but believe that, whilst the nervous system is principally affected, it is by the opposite of a nutrient and healthy action.

The statement as to the action of the heart is doubtless correct, as is also that upon the frequency of the pulse; but the latter action is indirect, and probably due to the former, whereby a larger quantity of blood is forwarded at each contraction of the heart, and the blood is more perfectly distributed to the whole body. A rapid pulse is commonly a small one, and the impulsion of a large quantity of blood at a time lessens the necessity for the quicker circulation of it.

It is singular that so acute an observer should have made so little reference to the effect of alcohol upon the skin, its power to accumulate water in the body, and to retard the elimination of urea; but in reference to the former I may remark that acetate of ammonia was a most frequent adjunct to his alcoholic treatment, and this might do much to counteract the action of alcohol upon the skin. Moreover, whilst he did not withhold alcohol when the skin was hot and dry, his cases were frequently such as had perspiring skins, and in such instances he remarked upon the diminution in the perspiration during the action of alcohols. It may also here be observed that Dr. Todd most commonly added chloric ether, and not unfrequently quinine, to his plan of treatment, and hence there were several actions induced, some co-ordinate and others opposed.

His statement in reference to the absence of alcoholic exhalation from the lungs in cases of diseases in which the alcohol is well borne, is worthy of further investigation; but on inquiry I do not find that this fact has been recognized by others. If alcohol passes off untransformed, it is evident that this cannot be true; but if it be true, it is a most valuable guide.

Upon the whole, I do not think that the arguments used by Dr. Todd are now sufficient to establish the theory of the action of alcohols, or to warrant his peculiar plan of administering them; but, on the other hand, I think that the practice which he pursued must rest only upon the ground of his personal authority.

It now remains to state the conditions and stages of disease to which alcohols, in various forms, seem to be fitted—the action in health being accepted as a sufficient guide—and it will not be difficult to show that the usual practice of the profession has been based upon truth, however little or much the mode of action may have been understood.

I think that it must be accepted that *the essential and direct actions of alcohols, as remedial agents, are, the increase of the force of the heart's action, the local stimulation of the stomach, and the diminution in the action of the skin;* whilst the most important independent actions are, the retention of urea and fæces by or with retention of fluid, diminution of certain secretions, and derangement of the assimilative process.

In conditions in which the force of the circulation is too feeble, there must be defective nutrition, innervation, and oxydization of the products of alimentation; for a certain full-

ness of the bloodvessels is clearly necessary to such brain phenomena as consciousness, as may be inferred from fainting; to excretion, as may be seen by the increase of urine after ingestion of fluids; to general innervation, by the sense of *malaise* which accompanies feeble and of *bienaise* which is found with proper heart's action; and a certain frequency and duration of exposure of the blood in respiration, is necessary to the proper interchange of gases, whilst a due amount of action of the heart, as well as of inspiratory effort, is required for the free circulation of the blood through the lungs. Hence, with weakening of the force of the heart, the muscular and nervous forces are weakened, and all vital processes are inadequate to health.

Such a state is that of general debility, deficient innervation, or exhaustion from numerous causes, temporary debility from over-exertion or anxiety, convalescence from almost all diseases, and the state of exhaustion in fevers with certain limitations.

If, in such conditions, alcohol be administered in such a manner as not to induce derangement of the system, it is easy to see how Dr. Todd's statement may be verified—viz., that it improves the nutrition of the nerve-structures, and does not produce inflammation; and, in addition, it may be shown that, by its power to increase the force of the circulation, it will prevent or remove the tendency to local congestion of organs, as the lungs and liver, and the results of such congestion—viz., effusion of fluid—and will improve the whole nutritive and vital powers of the body. This is certainly in accord with universal practice, both in this and former ages, for whilst we may appeal to the great mass of the profession in reference to their experience now, we have on record, in the works of Arteæus, an admirable description of the effects of wine in such conditions in his day, which we will transcribe. In the treatment of syncope, he remarks: "But if converted into syncope, and this also happens, (the power of life being loosened, the patient being melted in sweat, and all his humors being determined outwardly, the strength and pneuma being also dissolved,) we must disregard the delirium, and be upon our guard lest the patient be resolved into vapor and humidity.—Then the only support is wine, to nourish quickly by its substance, and to penetrate everywhere, even to the extremities, to add tone to tone; to rouse the torpid pneuma, warm that which is cold, brace what is relaxed, restrain those portions which are flowing outwards—wine being sweet to the sense

of smell, so as to impart pleasure; powerful to confirm the strength for life, and most excellent to soothe the mind in delirium. Wine, when drunk, accomplishes all these good purposes, for they become composed by the soothing of their minds, are spontaneously nourished to strength, and are inspired with pleasure."

But we require at least one other indication as our guide in the administration of alcohol, viz., the condition of the skin. The regulation of the heat of the body, as well as the due distribution of the volume of the blood to the central and perpheral organs, rests very much with the skin. We know very well the great benefit which results in the last stage of fevers in local inflammation, and in sun-stroke, from the free use of cold water to the skin, although that cools the body only by contact and radiation; and of the application of warmer fluids in similar conditions, which, so far as they were of lower temperature than the skin, directly cooled the body, and so far as they approached or exceeded that of the skin, and thus indirectly cool the body. Both these plans are of well known efficacy, and although apparently opposed, produce, or tend to produce, by different methods, the one result. Now, although there may be a deficiency in the heart's action, if the skin be hot and dry, it is manifest that great risk may follow the use of alcohols; and when, in the sthenic stages of fevers and inflammation, the force of the circulation is increased, from the resistance to the current of blood offered by the capillaries in the great inactive external organ of the body—the skin—it must tend directly to do injury. Hence, it was never the practice to give these substances in the active and hot stages of fever; but when the condition arrived in which the skin lost something of its dryness, and became soft, and particularly when it perspired, alcohols and bark became the sheet-anchor of the practitioner. With a perspiring skin, wine and other alcohols could be given profusely, and I once gave six bottles of port wine to a female in forty-eight hours, in such a condition occurring in fever. These are the states in cholera and in diphtheria in which very large quantities have been administered, with the effect of saving life from imminent peril.

Such, also, were the views of the ancients, for Arctæus again writes: "But if the period be already come to a crisis, if there be dew on the clavicle and forehead, the extremities cold, the pulse very small and frequent, or if creeping and feeble in tone, the patient must take a little food and

partake of wine effectually." And again: "But if much sweat flow, the pulse come to a stop, the voice become sharp, the breast lose its heat, we are to give as much wine as the patient can drink. For those who are cold, wine is the only hope of life."

Hence, a feeble pulse and an active skin are, and have always been regarded as the clear indications of the requirement of alcohol, and as the skin loses its exces of action, the rapidity of the pulse will decline, and its fullness and force increase. This is most perfectly exemplified in the case of many Europeans, even ladies, living in India, who find it really impossible to sustain innervation without the use of some forms of alcohol.

I have before referred to Dr. Todd's practice of giving acetate of ammonia, and may remark, in cases of fever, when the exhaustion had just begun, it was always the rule among practitioners to give ammonia, and not an acid, with the cinchona, with or without wine; and no doubt the true action of this was to temper the action of the bark and the alcohol upon the skin, so as to prevent a too rapid reduction of the action of the latter organ. It is, however, singular, that patients with hot and dry skin should have borne the exhibition of twelve or twenty ounces, and even much more of brandy daily, for weeks together, whatever may be the truth as to mortality or prolonged duration of the disease which followed its use. We see in health that there is a remarkable variation in the toleration of the system to the action of alcohol, and in certain conditions of disease we know that the toleration is much greater. If Dr. Todd's statements be correct as to the non-emission of the fumes of alcohol by the breath of certain cases in which large quantities have been given, it is quite open to question if, in such cases, the alcohol obtained its usual entrance into the circulation. This seems to be the explanation of the similar condition in cholera, where the vital power of absorption is greatly reduced, and it is quite certain that the body has naturally a power to limit the introduction of food and water into the blood, but allows it to pass off by the bowels. This is, probably, the safety-valve provided for such emergencies.

It has fallen to my lot to see cases of subacute inflammation of the lungs, and of the deposit which has succeeded to the inflammation, treated on Dr. Todd's method with alcohol, whilst the action of the skin was deficient, and I certainly have been impressed with the belief that the progress of such cases towards recovery was greatly retarded.

The action of alcohol in restraining the secretion of the saliva and of the mucous membranes did not appear to me, in such acute or subacute cases, to be of great importance; for whatever might be the state of the tongue, if the skin were freely acting, and other conditions called for the use of alcohol, the alcohol was well borne.

It is impossible to pass over in silence the influence of alcohol in lessening the excretion of urea; for if it do so simply by causing the retention of fluid in the body, it may be most prejudicial in cases of fever, where the whole safety of the patient seems to depend upon the elimination of the excessive amount of urea which then occurs. It is only when the amount of urea has naturally fallen with the subsidence of the febrile condition that alcohol can be safely administered.

But in any condition in which the amount of urea is lessened by reason of interference with the digestion and transformation of food, it is allowed by all that alcohol is injurious. In this condition it is very likely that the diminution in the flow of saliva may play a very important part, for it must greatly lessen the transformation of starch, and the retention of the fæces with other co-ordinate actions will explain the temporary condition of the liver and the headache, which are their constant attendants.

The efficacy of alcohol in delirium and coma has been quoted as a prime argument in support of recent views.—When the delirium is not the result of blood and brain disease, but indicates exhaustion, as in delirium tremens, syncope, or after fright, it is easy to explain that alcohol, opium, or bark, by giving force to the heart, and lessening the action of the skin and kidneys, is very likely to cause that condition of fullness of the bloodvessels of the brain which is necessary to perfect consciousness. In certain forms of coma the beneficial action of alcohol may be explained by its power to quicken the circulation. In both of these states we shall doubtless find that any remedy which acts in the manner now indicated will be equally beneficial with alcohol. Whilst there is so much diversity and apparent opposition in the remedies employed by various practitioners, there can be no doubt that they have a unity in the mode of their action which it is most desirable to discover.

The local action of alcohols upon the stomach does not call for remark since the direction of their action is evident and well understood. The statement that alcohol must im-

pede digestion, because when a substance is placed in it it becomes hard, can have no reference to the action of the moderate and diluted doses or alcohols which are usually employed in medicine.

The frequency and regularity with which alcohol should be given, when it is necessary to prevent exhaustion, have been well stated by Dr. Todd. As the primary action is temporary and passes away in half an hour, the call for it is quickly renewed, and in cases of imminent danger an interval of half an hour would be long enough.

As to the dose, I venture to recommend the use of small doses—say half an ounce of alcohol where spirits would be given; for we have shown that the frequent repetition of a small dose conduces both to a full and sustained action. It may be well to remember that, as spirits contain from 40 to 70 per cent. of alcohol, sherry and port wines from 17 to 24 per cent., and good ales from 6 to 10 per cent., two ounces of spirit are equal in alcohol to about six or eight ounces of wine, and twelve to sixteen ounces of ale.

In conclusion, I would invite attention to the use of the aromas of wines and the saccharine and nitrogenous elements of ales. It is clear that these have an action apart, and sometimes different from the alcohol, and therefore are fitted for different conditions. The conservative influence of the aromas of wines seems especially to be fitted for the cases of excessive nervous action, in which to reduce the action would conduce to health; whilst in fever it has been remarked that the newer wines, containing little aroma and more spirit than old wines, have a better action.

It is well known that a quantity of alcohol may be taken in wine, and particularly in good wine, in health, without affecting the sensorium, which could not be borne at all if drunk as spirits and water—a fact due partly to the greater length of time over which the drinking of wine is extended, and in other part to the opposing effect of the aromas. The value of the aromas has been recognised in all ages, and Artæus directs that "the wine is to be fragrant and not very astringent."

As sugar largely increases the evolution of carbonic acid, and gluton has a similar but less and less rapid action, and in the latter case at least the carbon could not have proceeded from the gluton, I am led to believe that beers have the power of directly promoting the assimilation of carbonaceous food. Whether this is due to the quality of a ferment which nitro-

genous matters possess, it is not here important to discuss; but the combination of alcohol with these principles, and with a bitter property, gives the most admirable compound which the word has seen, and especially fitted for the cases in which there are general enervation, defective powers of assimilation, and active state of the skin, as in the lassitude and exhaustion of many in hot climates.

Hence, there are certain cases in which alcohol is chiefly called for, and in which spirits of wine may be given quite as usefully as the ordinary compounds; others in which the aromas of fine old wines are of great value; and a third class in which the addition of the nitrogenous digestive agent in ales should be given.

I think it would be to the advantage of our patients if, in cases in which we desire the effect of alcohol, and not the other ingredients found in alcohols—viz., increase in the action of the heart and decrease in the action of the skin—we administered spirits of wine instead of spirits, because by obtaining it during the first hours of distillation, we may obtain nearly a pure alcohol, and by indicating the specific gravity we may at all times know the true amount of the agent which we would employ. Although alcohol varies very greatly in flavor and degrees of purity, and it commonly happens that the kind which is used in the manufacture of spirits is that which passes off in the latter hours of distillation, and contains much fusil oil and free acid, which are very injurious to health. Moreover, as there is a clear difference in the action of alcohol and fine old brandy, we have in alcohol an agent which will effect the two purposes above mentioned, and will at the same time support the respiratory organs.—*London Lancet.*

TREATMENT OF UTERINE INFLAMMATION BY NITRATE OF SILVER AND OTHER SUSTITUTIVE AGENTS.

By E. J. TILT, M. D., M. R. C. P.

In using these agents we apply the general principle of therapeutics to the treatment of inflammatory affections of the womb and its associated organs. The utility of a solution of acetate of lead in inflammatory affections of the skin implies similar utility in inflammatory affections of the vagi-

nal mucus membrane; the utility of solutions of borax and of chlorate of potash in affections of the mouth pointed to their trial as vaginal injections; the utility of sulphate of zinc and nitrate of silver in urethral strictures demonstrated by J. Hunter, Sir E. Home, Lallemand, etc., suggested their employment in uterine catarrh; the sovereign utility of the solid nitrate of silver for the cure of cutaneous ulcerations caused it to be tried in ulcerations of the womb. To whatever mucous membrane these agents are applied, they act in the same way—they substitute a therapeutical irritation, susceptible of being graduated to a morbid irritation, which might uncontrollably compromise the strictures attacked—a temporary irritation to one that tends to become permanent.

In treating of injections, I have already enumerated several agents which act in this way, such as borax, chlorate of potash, acetate of lead, alum, sulphate of zinc, etc. They are generally given largely diluted, but if used in a solid or highly concentrated state, the action of these agents would be analagous to that of two other important agents, nitrate of silver and tincture of iodine, which are called caustics by courtesy, but are no more caustics than tincture of cantharides. I wish it to be clearly understood that I hold these agents sufficient for the surgical treatment of uterine inflammatory diseases in the large majority of cases, and so does Dr. H. Bennett, although it has been stated that we use strong caustices in ordinary cases of uterine disease. In a comparatively small number of instances, the strictures of the womb have been too deeply modified by inflammation or by hyperthropy, and are in so low a state of vitality, that the above named agents are insufficient to bring about the cure of disease. Then I have recourse to another class of substitutive agents, which are undoubted escharotics, for they cause a loss of substance proportionate to the amount of caustic used.—Those caustics induce healthy acute inflammation in the tissues underlying the eschar, and, by judicious management of this healthy inflammatory action, the cure of chronic cases is often induced.

The causes of which I shall treat are, the acid nitrate of mercury, potassa fusa cum calce, potassa caustica, and the actual cautery. At first sight it may seem strange to class together sulphate of zinc and potassa fusa cum calce, but one is justified in doing so, because the substitutive action which I ascribe to a solution of sulphate of zinc is pre-eminently shown in the results of potassa fusa cum calce, which often so

raises the vital endowments of the uterine tissues as to promote rapidly healthy nutritive action in tissues which had been diseased for many years.

Such is my mode of practice, and I am glad to find that it accords to a certain extent with the practice of all whose opinion carries weight, and who, having in vain tried to cure uterine disease by nitrate of silver or milder measures, have recourse to one or the other of the strongest caustics. Dr. Fleetwood Churchill depends on nitric and muriatic acids, and on the acid nitrate of mercury, which is also preferred by Dr. E. Kennedy and by Dr. West; and although this distinguished pathologist considers ulceration of the cervix to be a condition of slight pathological importance, when he has to trace out a plan of treatment for his pupils, he has none other to propose than that long ago carefully laid down by Dr. H. Bennet. The late Dr. Rigby, though adverse to the surgical treatment of uterine affections, admitted that there were certain cases of uterine ulceration requiring the use of potassa fusa or potassa fusacum calce. Dr. H. Bennet prefers potassa fusa cum calce. This is not energetic enough for Professor Simpson, who uses potassa caustica; while the French strongly advocate a remedy older than Hippocrates, the actual cautery.

These comments upon the treatment of uterine inflammation will show that I am an eclectic, and that I use all the valuable agents which I have enumerated in certain cases which I shall specify. Again reminding the reader that I am not writing a treatise, I shall proceed to comment on the use of our principal substitutive agents.

Tincture of Iodine.—It is the ordinary tincture of the Pharmacopœia which I mean, not the caustic tincture. I shall be brief on this agent, having already mentioned it as a revulsive, and having compared it with others then under discussion. Tincture of iodine seems to act as an astringent when slightly applied to the hypertrophied or inflamed surface of the neck of the womb, but as a vesicant if several applications are made at one and the same time, and as a resolutive if re-applied every third or fourth day. It is much less useful than nitrate of silver as a topical application, but it suits better some idiosyncracies, and is well borne in diphtheritical inflammation, when nitrate of silver should not be used. The fact that a solution of iodine can be injected into closed cavities and fistulous passages without severely inflaming them, marks it out as the best liquid to be injected

into the body of the womb, in the very rare cases requiring such treatment; for it has less frequently given rise to the alarming symptoms of peritonitis, which have very often followed the intra-uterine injection of a solution of nitrate of silver. I use one drachm of the tincture to an ounce of distilled water, and inject it by means of an instrument similar to that devised by Mr. Coxeter for injecting fluids into the larynx.

Nitrate of Silver.—"The application of nitrate of silver is a means, under certain circumstances, of subduing external inflammation. Might it not, on this principle, be of service in the treatment of the internal phlegmasia?" Such was the question asked by Dr. Higginbottom in the preface of his admirable little work on "The Lunar Caustic," published in 1826. His question has been answered in the affirmative by a great many eminent practitioners, who have applied nitrate of silver for the cure of inflammatory affection of the mucus membrane of the eyes, ears, mouth, throat, urethra, the intestines, and the rectum. As regards the mucous membrane of the genital organs, Dr. Jewel, in 1830, strongly advocated its use; and I have no hesitation in saying that this agent is quite as useful in curing the varied inflammatory conditions of the genital organs as in curing those of the skin. It is often necessary to preface the use of nitrate of silver by linseed tea, poppyhead, or other cooling injections, in the same way that Mr. Higginbottom repeatedly inculcates the utility of cold poultices previous to applying nitrate of silver to the inflamed skin. If, after antiphlogistic treatment, the solid nitrate of silver increases too much habitual pains, or causes the ulcerated surface to bleed for two or three days afterwards, it is well to try a solution of from forty to sixty grains of nitrate of silver to an ounce of distilled water. In many cases the solution is sufficient to effect a cure; it gives less pain, but it may be necessary to repeat it every third or fourth day.—Sometimes I use a solution of nitrate of silver containing one ounce of salt to two or three ounces of distilled water, as an application to ulcerated surfaces. Chronic uterine catarrh, or inflammation of the mucus membrane lining the neck of the womb, which has been truly called an open gland pouring out mucus from ten thousand follicles, seems to me the most frequent of all uterine diseases. Without having the slightest abrasion, the mucous membrane lining the neck of the womb and its vaginal surface may be of a dusky, livid hue, tender on being touched, and secreting pus. This condition may last

for years, but it generally leads to more or less extensive denudation of the villi of the uterine mucous membrane, and gives an excoriated appearance to the neck of the womb. Such cases, with or without excoriation, can be cured by the nitrate of silver in solution, used every fourth or fifth day, with the occasional use of the solid nitrate. If the mucous membrane lining the cervix be principally affected, it is often so obstinate as to render the painting of it with solution of little use. The solid nitrate must be freely employed, and when the cervical canal is unusually dilated, I sometimes leave about one-eighth of an inch in the canal; by which it will be clear that, so far as my experience goes, should the stick accidentally break in the cervical canal it need give no alarm. What cannot be removed will cause more pain, some loss of blood, and perhaps even a return of menstruation; but the patient may be repaid for greater suffering by a speedier cure. It has been stated by Nonat that this mode of treatment has caused stricture of the uterine canal in his practice and in that of Richet. I have never met with this accident, and I think its occurrence is to be prevented by the occasional passage of the uterine sound for a few weeks after this severe application.

With regard to the treatment of the various forms of ulceration of the neck of the womb, I can add nothing to what has been so well laid down in Dr. H. Bennet's work. Mr. Higginbottom, whose statements with respect to the action of nitrate of silver deserve the highest consideration, affirms that its action does not extend beyond three days after its application; and it is generally received that it is necessary to repeat the use of this agent so soon as the epithelial pellicle has fallen off, or every third or fourth day. In many instances this is the best way of insuring the most rapid recovery; but I do not recommend the too strict adherence to this precept, as it is often well to leave five, six, or seven days interval between the applications, or we might work as did Penelope, and retard the cure of the case. This, however, is a matter of surgical experience in each individual case.

Whether vaginitis occurs spontaneously or as the result of uterine catarrh, it is best cured by the injection of a solution of nitrate of silver. This is an excellent idea of Dr. Jewel's, but if the solution be sufficiently strong to do good it cannot be safely trusted to the patient. The patient being placed on her back, a small glass speculum should be introduced as far as possible, and an ordinary glass syringe full of a solution of nitrate of silver, containing forty grains to the ounce,

should be injected. The speculum should then be withdrawn to the vicinity of the vulva, and the fluid should be left in contact from three to five minutes, after which the speculum is to be withdrawn, and the fluid received in a small cup.—Sometimes I apply a speculum of appropriate size, and as I withdraw it I pretty freely touch the vagina with the solid nitrate of silver diluted by chloride of silver, as prepared by Mr. Squire. This is a modification of a plan which is recommended by Ricord.

I recommend these injections where there is evidence of inflammation of the womb, with excoriations of its cervix, in virgins in whom the integrity of the hymen prevents the introduction of a moderate-sized speculum. This plan should be first tried before forcibly dilating or incising the hymen—an operation which is very rarely required. I have frequently made these injections in many cases, and I do not once remember having traced menorrhagia to their administration. I mention this as it seems to have often occurred in the practice of Dr. Fleetwood Churchill. So many serious accidents have followed the injection of the solution of nitrate of silver into the body of the womb, that I prefer using tincture of iodine in solution whenever intra-uterine injections may be required. In very rare cases of chronic internal metritis it may even be necessary to apply the solid nitrate of silver to the internal surface of the body of the womb, as well as to adopt other modes of treatment, for an account of which I refer the reader to my papers on the Treatment of Internal Metritis.*

In follicular inflammation of the labia, in eczema and prurigo pudendum, or puritus both external and vaginal, a piece of cotton-wool should be soaked in the solution of nitrate of silver, and carefully rubbed for two or three minutes over the diseased portions of the skin and mucous membrane. I can speak with confidence of this plan, for I have lately cured several patients who have been suffering in this way for four, eight, and thirty years. When cases have lasted so long the pudendal skin looks and feels like parchment. It was so in the case of a lady in whom the disease had lasted thirty years, and I first rubbed in the solution every day, then every other day, then every fourth and fifth day, until the skin became soft and pliable, and the sleep was no longer disturbed by darts of pain flashing along the nerves. This patient was

* The Lancet, 1853, vol. ii.

cured in three months, and has had no relapse during the last year.

I trust I have said enough in praise of nitrate of silver; but in many forms of uterine inflammation much more severe agents are required to restore the womb to a healthy state. This fact is admitted by so many authorities at home, in America, or in foreign countreis, that I am surprised to find the contrary asserted by Dr. Meigs and Dr. Tyler Smith. After describing the evil effects of caustics in the treatment of uterine disease, the latter pathologist, in his work on "Leucorrhœa," (p. 203,) gives as his opinion that "there is no good which can be effected by the more powerful caustics which cannot be accomplished by the nitrate of silver, or by other means. It is true that by the prolonged application of the nitrate of silver loss of substance may be caused; but this is far less likely to occur with lunar caustic than with the more powerful escharotics. It is also true that some practitioners apply the more violent caustics so lightly that they do not exceed the milder action of the solid nitrate of silver; but in such cases it would be quite as well to use the safer remedy where a caustic is required." And at p. 206, "In applying the nitrate of silver, the aim should be not to produce any slough or loss of substance." Thus it is clearly stated that the slight application of the strong caustics is tantamount to the full action of the nitrate of silver in like cases of uterine disease.

My experience, on the contrary, teaches me that nitrate of silver is no more a caustic than tincture of cantharides, as Mr. Higginbottom has long ago asserted.[1] The distinction that Dr. Meigs draws between the antiphlogistic touches and the escharotic action of nitrate of silver, does not bear examination. Use it as you may the nitrate of silver does not cauterize. Leave it in the neck of the womb, it will cause more pain, loss of blood, and subsequent discharge, but no destruction of tissue, unless coagulate mucus mixed up with epithelial scales and insoluble chlorides of silver can be called such. Even when applied to a fungous ulcer, the slight loss of substance is rather due to the friction of a hard body on a pulpy than to the chemical combination of the neutral salt and the diseased tissues. A densely hyperthropied neck of the womb might be whitened with the solid nitrate of silver every fourth day until doomsday, without much reducing its bulk. Indeed I have seen such a plan of treatment injudiciously continue for a year or longer in a case of hysteralgia, the neck of the womb

being healthy and of an average size, and the effects were rather astringent than caustic, condensing the tissues, narrowing the cervical canal, and rendering its dilitation necessary and difficult. Thus, while nitrate of silver may be repeatedly applied without inducing a loss of substance, the slightest application of the potassa fusa to the neck of the womb produces an evident loss of substance; and, therefore, the two agents, however applied, produce totally different effects in similar cases. This is a question of surgical therapeutics which can be decided by any experienced surgeon. Writing on the treatment of stricture caused by gristly thickening of the urethral mucous membrane, Mr. Wade records his twenty-five years' experience of the comparative advantages of nitrate of silver and of potassa fusa, and he states: "I cannot let this opportunity pass without again calling attention to the fact, that the effects of the argenti nitras and of the potassa fusa admit of no comparison, as they are totally dissimilar; that the former, when freely used, from its tendency to cause adhesive inflammation, has often been found to increase the urethral obstructions, whilst the remarkable solvent powers of the latter have no such tendency."

The too free use of nitrate of silver to the inodular tissues of the urethra causes urethral stricture, as the too free use of the same agent to the cervical canal causes stricture of the neck of the womb, but without loss of substance. Indeed, if the whole range of diseases in which nitrate of silver is now used be passed in review, it will be found that it always acts by its dynamic, astringent, and antiphlogistic properties; whereas escharotics can only raise the standard of vitality of any given tissues by the previous destruction of their superimposed surface. I maintain, on the contrary, that there is one good to be done with the more powerful caustics which cannot be accomplished with the nitrate of silver; that is, to shorten the treatment of many cases in which it is at first judicious to try it. Ulceration of the neck of the womb, on a hypertrophic basis, may doubtless be sometimes cured by the use of nitrate of silver, but the treatment might be indefinitely prolonged; whereas it can be very much shortened by one or two applications of the acid nitrate of mercury or of potassa fusa c. calce. When the inner cervix is chronically inflamed, nitrate of silver may enable us to effect a cure; but with that agent, however applied, cures are sometimes so tedious that it is well to resort to one or two applications of the acid nitrate of mercury or of potassa fusa c. calce. In fungous and varicose

ulceration the nitrate of silver causes the surface to bleed profusely, and does more harm than good; whereas I find that in these cases the acid nitrate of mercury and the actual cautery stop the bleeding and promote a cure. I think it right to be sparing of caustics to the neck of the womb in pregnant patients; but I have seen cases similar to those described by Dr. Bennet in which it was necessary to stop an abundant purulent and bloody discharges from a large varicose ulcer, and I have done so with the acid nitrate of mercury after doing more harm than good with the nitrate of silver. So little are caustic agents and nitrate of silver interchangeable substances or thereapeutical equivalents, that I find nitrate of silver in some cases to be positively poisonous, while potassa fusa c. calce conduces to recovery. In diphtheritic inflammation of the neck of the womb and of the vagina, nitrate of silver acts as a poison. In a case now under treatment there is a small patch of false membrane on the posterior lip of the os uteri, and around it are numerous ulcerations. Were I to touch them with nitrate of silver they would soon be covered with false membranes. Tincture of iodine would not produce this effect, neither would the potassa fusa c. calce; these, therefore, are the best means of curing this tedious complaint, of which I have seen two instances and Dr. Bennet three, and he would endorse what I affirm of such cases. Occasionally we met with cases like two I am now attending, in which an extensive superficial excoriation of the neck of the womb bleeds profusely, and for the following two days, even when only touched with the solution of nitrate of silver, which likewise makes the sore more angry. In such cases as these I have nearly effected a cure by dressing the wound with tincture of iodine or the acid nitrate of mercury.

The profession is more and more convinced of the great utility of caustics in many diseases; were it otherwise, surgery would be deprived of a valuable remedy, and the obstetric art robbed of the only means of curing the most distressing cases of uterine inflammation. Patients would thus have to drag on from year to year their weary load of misery, with the only hope that the cessation of menstruation, by putting an end to the physiological liability of the womb might also check its liability to inflammation.—*London Lancet.*

From the *Journal of Materia Medica* we extract the following collection of convenient formulæ:

FORMULA FOR THE ADMINISTRATION OF PROPYLAMINE.

℞ Propylamini Chloridi.....gr. xxxvj.
Sacchari Pul.....ʒ ij.
Aq. Menthæ Pip.....f ʒ vj. M.
ft. solutio.

S. Dose.—A tablespoonful every two hours.

ASTRINGENT WASH FOR THE GUMS.

℞ Acid Tannici..... 8 parts.
Alcohol (86°).....120 "
Tinct. Benzoës..... 8 "
Essent. Menth..... 2 "

M. and filter. Mix a few drops of this liquid with water, and wash the gums two or three times a day.—*Dental Cosmos.*

McLEAN'S NEURALGIC LINIMENT.

℞ Extr. Belladonnæ.....4 grains.
Aq. Ammoniæ.....6 fl. ounces.
Ol. Terbinth.....½ "
Ol. Olivæ.....½ "
Tinct. Opii.....2 "

Apply during the paroxysm.—*Druggist's Circular.*

IODIZED LIQUID FOR DISINFECTING WOUNDS.

Dr. Marechal, of Calve, prescribes:

Iodine.....Ffteen and a half grains.
Iodide of potassium...Thirty-one "
Distilled water.....Three pints.

Apply compresses soaked in this liquid to the wounds, changing them several times a day, or, without changing the compresses, keep them saturated with the iodized solution.—*Druggist*, from *Répert. de Pharm.*

STEARATE OF IRON IN CHANCRE.

Ricord has employed, for seven months, in the Hospital du Midi, an ointment and plaster of stearate of iron, as a dressing for soft or phagedenic chancres. They have been of great service in all cases where the phagedenic action resisted the numerous means usually employed. M. Braitte, pharmaceutist of the hospital, gives the following formulæ for these preparations:

OINTMENT OF STEARATE OF IRON.—Take sulphate of iron, 500 grammes; Marseilles soap, 1000 grammes. Dissolve the sulphate of iron in about 1500 grammes of water, and the soap in an equal quantity of water. On pouring one solution into the other, a whitish green precipitate is obtained, which is dried, and then melted at a moderate temperature of 80°–84° R. Add to the melted mass, on cooling, 40 per cent. of essence of lavender, and stir it constantly until it becomes perfectly cold.

SPARADRAP OF STEARATE OF IRON—BRAITTE'S PLASTER.—Take of the stearate of iron, obtained by the process directed above, q. s.; melt it at a moderate temperature, and spread it on muslin like the ordinary sparadrap.—*Journal de Pharm., Savannah Jour. Med.*

THOMPSON'S EYE-WATER.

℞ Sulphate of copper.....Ten grains.
Sulphate of zinc.....Two scruples.
Rose water.....Two pints.
Tinct. of saffron, Tinct. of camphor, each.....Half an ounce.

Mix and filter.—*Druggist's Circular.*

OINTMENT FOR WARTS.

℞ Chromate of potass.....Two grains.
Lard.....One drachm.

Mix. Rub the warts with it twice a day, for thsee or four weeks.—*Druggist*, from *Bull. de Therap.*

GLYCEROLE OF ZINC.

℞ Sulphate of Zinc.....Two drachms.
Glycerine.....Two ounces.

Triturate together until the sulphate is completely dissolved. A good application for external hæmorrhoids, brushed over with a camel's hair brush.—*Dr. C. A. Hartmun, Cleveland.*

DYSPEPTIC BITTERS.

℞ Gentian root, bruised.....Two ounces.
Orange Peel..... " "
Quassa, rasped.....Half ounce.
Cardamon seed, bruised,..... " "
Caraway " ..... " "
Cloves " .....Two drams.
Diluted alcohol.....One gallon.

Mix, and prepare according to art.—*Druggists Circular.*

BROWN'S BRONCHIAL TROCHES.

℞ Powdered extract liquorice.....1 pound.
Powdered sugar.....1½ pounds.
Powdered cubebs.....4 ounces.
Powdered gum arabic.....4 ounces.
Extract of conium.....1 ounce.
—*Druggists Circular.*

CITRATE OINTMENT MADE WITH BEAR'S OIL.

Mr. Wm. Pr. Creecy, of Vicksburg, Miss., sent a specimen of this preparation to the editor of the *American Journal of Pharmacy*, who publishes the recipe:

Mercury.....℥j.
Nitric acid.....f ℥ xiv.
Bear's oil.....f ℥ xiij.

Heat the oil in a porcelain capsule to 200 deg. F., and add the solution of nitrate of mercury gradually, stirring continuously till effervescence ceases, and frequently till cool, with a glass or porcelain spatula.

PRESCRIPTION FOR CONSUMPTION.

Dr. C. T. Horton (*Baltimore Journal of Medicine*), uses the following prescription in the treatment of consumption, Bronchitis, etc.:

℞ Etherial tincture of Indian Hemp....½ pint.
Extract of liquorice.....½ lb. (Troy?)
Carbonate of potassa.....½ "
Warm water.....1 gallon.

The dose of this is a table-spoonful three times a day, gradually increased to two. The ethereal tincture is obtained by dissolving two ounces of the alcoholic extract of hemp in a pint of sulphuric ether.

EMBROCATION FOR INFLAMMATION OF THE MAMMÆ.

Dr. E. M. Hale recommends the following embrocation for inflammation of the mammæ:

℞ Fluid extract of aconite.....1½ ounces.
" " phytolacca.....1 ounce.
Iodine potassium.....1 dram.
Warm water.....1 pint.

Wet linen compresses and apply constantly. No application with which I am acquainted will so surely prevent tumors of the mammæ from taking on the suppurative process. Even if suppuration have taken place, it resolves the indurations, and relieves the pain.—*Med. and Surg. Reporter.*

LEAD IN THE TREATMENT OF PHTHISIS.

Remedies for phthisis, if recommended with the least show of authority, are always eagerly sought for. The number of cases of recovery from tubercular disorganization of the lungs is sufficient to keep alive in the minds of the professional, as well as unprofessional public, the hope that some cure may at last be found for it. By the London *Lancet* for August 17th, we see that M. Beau places some confidence, at the present time, in the use of lead in the treatment of this disease. Its Paris correspondent writes, in speaking of the last clinical lecture of M. Beau—

"Phthisis," he said," "has been cured by all sorts of methods and in all sorts of ways; the fact being that, as this malady depends upon the reciprocal action of a diathesis and of globular anæmia, the remedy which is able to oppose the progress of the latter condition may not only prevent the disease from making further inroads on the system, but also contribute to the healing of such lesions as already exist. My intention is not certainly to enumerate all the means for treating consumption which have in turn been extolled and employed against this malady; you will find them detailed at length in the treatise of Baumes, of Montpellier, published in 1805. I shall limit myself to a few." After mentioning sea voyages, horse exercise, southern climates, emetics, chloride of sodium, asses' milk, Iceland moss, conserve of roses, quinine, fir-sprouts, watercress, sulphur, sulphureous waters, cod-liver oil, iodine, turtle-soup, snail-broth, oysters, strawberries in great quantities, hydrotherapy, the hypophosphites, and steel, the lecturer at last arrived at his favorite remedy—lead. "The employment of lead," he said, "in the treatment of tubercular consumption is not new. The idea is a borrowed one. What is new, is the manner in which I administer it, and in which I have understood its action. I must first tell you how I was in the onset induced to employ it. Starting from the theory, which I hold in common with many other observers, that the development of tubercle is favored by the anæmic state, I had been struck by the fact that the workmen employed in establishments where lead is much handled, although anæmic and cachetic to the last degree, very rarely present symptoms of tubercular deposit in the lungs.

During a period of six or seven years at the Hospital Cochin, amongst the many patients whom I treated for lead poisoning, I never saw a single case of phthisis. Once only, in the lungs of a house-painter, I met with tubercle; but I subsequently ascertained that this man had never had any of the signs of the saturine affection. I went a step further, and inquired into the diseases usually met with in the trades habitually working with lead, and found that cough among operatives of this class was of rare occurrence. I began then to think within myself that if lead could prevent, it might, also very possibly cure, phthisis, and was much tempted to make the experiment, but waited for further evidence, and was presently emboldened by an accidental occurrence. Shortly after my entry into the service of the Charite, a man, affected with lead colic, fell under my observation. On examining his chest I found evident symptoms of tubercular deposit; and on inquiry, ascertained that the patient had been consumptive for years. Finding himself without work, this man had taken a job at the lead works at Clichy, and there had caught his colic. He assured me that since his seizure both cough and expectoration had diminished; in fact, so much so as to have made him think it useless to direct my attention to the state of his lungs. He left the hospital some time afterwards, cured of his colic, and with considerable improvement of the pulmonary symptoms. In the case of a second patient, who shortly afterwards entered my wards, I was informed that the signs of consumption, held in abeyance during repeated attacks of lead colic, had reappeared each time that the latter malady had been removed. I endeavored, on the verification of this fact in my hospital service, to reproduce the saturnine when the phthisis seemed inclined to gain ground, and succeeded beyond my expectations in arresting its progress on several occasions. Such were the incidents which led me to the adoption of my present method of treatment, and *the results I have obtained are not of a nature to justify me in laying the method aside.* The following is the manner in which I employ this drug: I begin by administering an emetic, in order to arouse the stomach from the state of torpor which it is so common to meet with, either as cause or effect, in tubercular phthisis. After the lapse of a week or thereabouts, I commence the lead (I prefer the carbonate, as being better borne by the stomach than the acetate), in pills of two grains each. The dose is taken at first once a day, then twice, and so on, until six pills, or twelve grains of

the lead, are swallowed within the course of twenty-four hours; the best time for administration being before each repast, as the drug is that moment less likely to cause vomiting. This treatment must be continued until a sufficient saturnine impregnation has taken place, a generous diet being allowed the patient at the same time."

M. Beau has added an appendix to his two former lectures during the course of the week, which, as it completes his previous observations on the *lead* treatment of phthisis, I think I may interest your readers by recording.

"With regard to the first effects," he says, "noticeable on the employment of lead in dealing with consumption, the most favorable is the amelioration of the cough and expectoration. Sometimes at the end of two, at others at the end of eight or ten days (the difference of time depending on individual peculiarity), the cough, from being incessant, becomes less frequent, and allows the sufferer some respite, enabling him to sleep. The expectoration, from being abundant and purulent in nature, diminishes and becomes less copious, and of a mucous character. This is not all; you will remember one particular character of the tubercular sputum, long ago recognized by Fouquier—namely, that in pasing from the larynx to the mouth, it almost invariably, by virtue of a specially irritating property it possesses, irritates the pharynx, and produces an effort of vomiting. Another mark of the progress and success of the saturnine treatment, is precisely the cessation of this retching during expectoration. At a variable period, also, and consequent upon the amelioration in the cough and sputa, the physical signs furnished by auscultation likewise bear testimony to diminished activity in the pulmonary suppuration. The subclavicular pains diminish, and can hardly be recalled by pressure with the finger, and the nocturnal hectic fever very generally disappears entirely. I say the *nocturnal* fever advisedly; for you know the grave prognostic which attaches to the continued form of fever when occurring in this disease. With regard to the *physiological* effects of lead on the system, the first remarked is, for the most part, loss of appetite. There are, however, certain cases in which the administration of this drug seems rather to excite than to repress the digestive functions and desire for food, and such are certainly the most favorable; for here, in addition to the advantages afforded by the special action of the medicine, we have the concurrence of an active nutrition. Moreover, it is to be noted, that those patients in whom the

functions of the stomach remain undisturbed, enjoy perfect immunity from the poisonous effects of the remedy. Such cases are, however, too rare to be counted on. In addition to the loss of appetite, gastralgia very generally supervenes, and occasionally, but rarely, vomiting, dry cough, and dyspnœa, the latter symptoms being exclusively of a gastric origin, and unconnected with increase of morbid action in the lung.—The colic produced by the administration of lead for a therapeutical purpose differs from that witnessed in workmen who have incurred saturnine intoxication in the exercise of their trade, in one important particular—namely, that whilst in the first diarrhœa is very generally induced, in the second case obstinate constipation for the most part exists. The blue line on the gums is another effect of the lead treatment, and appears from the tenth to the fifteenth day. Some patients there are, however, who, though presenting the other indication of saturnine saturation, are without this particular sign of constitutional affection. I believe that the blue line is only seen when there is some superficial erosion or ulceration of the margins of the gum. The predominating symptom of the therapeutical intoxication and that which is the most constant of all, is pain occurring in certain portions of the body. This pain, which appears at variable periods during the treatment, as early sometimes as the second, and rarely later than the tenth day, is occasionally present in the trunk, but mostly in the arms and legs. It is either of a shooting, darting description, or may resemble the pressure of a heavy weight, or the constriction of a metalic ring round the limbs. The physician at the same time must be careful to distinguish between the pains symptomatic of phthisis and those induced by the treatment." M. Beau likewise informs us that he never witnessed either epilepsy or those other brain symptoms occasionally met with amongst lead-workers, and ends by saying that he believes the cases of phthisis are very rare in which a saturnine treatment will not be found useful in either arresting or retarding the progress of the disease.

EDITORIAL.

The Pathology and Treatment of Venereal Diseases. By reeman J. Bumstead, M. D., New York. Blanchard & Lea, Philadelphia.—On the announcement of this work, we were prepared for an addition to the catalogue of eminently useless works, but on its reception and perusal we return to the authors and publishers our most hearty thanks, for by far the most valuable contribution to this particular branch of practice that has seen the light within the last score of years.

The time worn notions and methods of practice contained in most of the so-called standard treatises upon this subject, every observant practitioner must have seen to be wholly inadequate and imperfect. We hesitate little in saying that no medical man, with a fair average of practice in this class of diseases, has found it possible to accept either the principles or treatment laid down in the vast majority of works on the subject—he certainly would have little cause to plume himself upon his success were he to attempt any such reliance.

The present work is brought up to the level of the time, by a clear sighted observer, of copious reading and large practical experience. Many of his views will strike those who have merely a book-knowledge of the subject as novel and perhaps as incredible, but experts will yield most of them immediate assent. Dr. Bumstead epitomizes in his preface the most important topics as follows:

"*The distinct nature of the two species of Chancre;* the innocuousness of the secretion of the infecting chancre, when applied to the person bearing it, or to any individual affected with the syphilitic diathesis; the removal of certain obstacles to a general belief in the contagiousness of secondary lesions; the fact that syphilis pursues the same course, whether derived from a primary or secondary symptom, commencing in

either case with a chancre at the point where the virus entered the system; the definite period of incubation of the true chancre, and of general manifestations; the inefficiency of the abortive treatment of syphilis; and the phenomena of syphilization and their correct interpretation."

To say that the author has given a perspicuous and complete elucidation of all these remarkable ideas is not beyond what the book warrants. Yet those of our readers who have not kept pace with the investigations of the last decade upon this subject, will be a little startled at reading of the corroding venereal ulcer,—phagædenic perhaps—as totally distinct in nature from true syphilis. But the author to our mind proves, so far as can be done in such subjects, "the quality of syphilis." Myriad enigmas are unravelled by the process of developement of this idea. Hereafter we must recognize "the Chancroid and its Complications" as quite a different disease from the true hard, infecting chancre, "the initiatory lesion of acquired syphilis."

The first part of the work, which treats of "Gonorrhœa and its Complication," establishes the non-identity of Gonorrhœa and Syphilis; advocates the origination of true Gonorrhœa from the secretions of women not specifically diseased; the occurrence of gonorrhœal symptoms and even contagious discharge in the male without previous coitus; and we must confess upon these latter points indulges in latitudinarian views which are largely at variance with many preconceived opinions. It seems remarkable that so many escape infection.

Irrespective of the novelties in opinion contained in Dr. Bumstead's book, many of which may challenge discussion, his clear and accurate descriptions of the various forms of venereal disease, and especially the methods of treatment he proposes are worthy of the highest encomium. In these respects it is better adapted for the assistance of the every day practitioner than any other with which we are acquainted.—In variety of methods proposed, in minuteness of direction, guided by careful discrimination of varying forms and com

plications, we write down the book as unsurpassed. It is a work which should be in the possession of every practitioner.

The Morbid Effects of the Retention in the Blood of the Elements of the Urinary Secretion. By W. W. Morland, M. D. Fiske Fund Prize Essay. Blanchard & Lea, 1861, pp. 83.—This monograph, first presented to the Rhode Island Medical Society as a prize essay, then published in the American Medical Journal, was believed worthy of appearing in a more permanent shape, suitable for the library and reference, and the consequence is its appearance in thin octavo in the usual neat style of Blanchard & Lea. It is a valuable *resume* of observations upon this deeply interesting topic both original and collated. Whilst the greater proportion of the matter is to be found scattered throughout monographs and various systematic treatises, the author has done the profession essential service by bringing it together in compact form, and by careful study has separated much of the unreliable, or worse, which has been permitted to confuse the student. He discusses first the normal constituents of the secretion and then respectively the effects of each when unduly retained.—Nineteen pages are thus devoted to the retention of Urea;—about twenty pages to that of Uric Acid; six pages to Creatine, Creatinine and Hippuric acid; the same to Chlorine and Chloride of Sodium; four to Ammonia; and three to Iron and Uræmatine.

The treatise although brief, is quite complete, and no educatad physician can dispense with the information contained. Time has been when the stomach was considered the seat of about all diseases; the liver also has been charged with most of the disorders to which flesh is heir; but the kidneys, considering the well known importance of their functions, it is safe to say have not as yet attracted professional attention to a suitable extent. How many cases of convulsions, puerperal and other; how many cases of congestion of the brain and

other organs, have owed their presence and fatal result to lesion or failure in action of the renal organs so little noticed, so little studied! We trust that general perusal of this essay may recall the attention of the profession to the fact that disease of these organs is not infrequent in occurrence and is always dangerous.

Physician's Diary and Visiting List for 1862. Lindsay & Blakiston. From W. B. Keen & Co., Lake Street. It is scarcely necessary to more than announce the issue of this now established medical "institution"—about every physician being familiar with its convenient character and arrangement.

Attention is directed by an Eastern cotemporary to a few omissions which it would be well for each purchaser to insert with his own pen. Among the list of antidotes *Tannin* should be recognized as antidotal to *Strychnia*, and the effects of *Liquor Potassæ* in neutralizing the narcotic effects of Belladonna should not be forgotten. In directions for restoration of suspended animation, it is also suggested that the Sylvester method has been again revived in preference to Marshall Hall's, which for a time had superseded it, and to this also might well be super-added the means recommended for the restoration of persons under the influence of Strychnina.

Elmer's Hand-Book of Practice for 1862, is received from the publishers, and it is filled as in former years, with matters of convenience and interest to every practitioner of medicine. Those who have once made use of it will hardly content themselves without it. It may be procured at S. C. Griggs & Co's.

Map of Virginia.—Mr. James T. Lloyd, the enterprising publisher, whose map of the Southern States we noticed in lithe last issue of the Journal, has laid us under renewed obgations by forwarding the official map of the eastern half of the State of Virginia to be soon followed, as he promises, by

that of the Western half. It is the only full, complete and authoritative map published, and is beautifully executed.—We cordially recommend it to all interested, (and who is not?), in the stirring events now transpiring on the "sacred soil."

Treatment of Fractures of the Long Bones, by simple Extension. By John Swinburne, M. D., one of the Surgeons of the Albany City Hospital. From the author. This pamphlet of fifty pages is a reprint of a paper read by Dr Swinburne, before the New York State Medical Society at their last meeting, and which was briefly noticed in this Journal soon after. It is now put in a more accessible and permanent form, illustrated with appropriate diagrams, and we find bears re-reading excellently well. The author sustains his positions with great vigor and force. The importance of the subject demands the general attention of the profession. The simplicity of the apparatus recommended is not the least of its merits, although general adoption of the practice would sadly interfere with the profits of the splint makers, and rob the walls of the physician's office of the formidable array of paraphernalia with which after a few years of practice they are prone to be encumbered. Dr. Swinburne depends upon nature to supply splints and compresses in the shape of muscles, fasciæ, integument, etc. By his methods he claims that all varieties of fracture of the long bones can be as well treated in a country farm house, miles away from the splint makers, the carvers and moulders as in the best appointed hospital with its almost endless variety of instrumental devices.—In these days of prosecutions for *malapraxis*, every surgeon ought carefully to investigate every systematic method of treatment of fractures which promises exemption from deformities which will sometimes occur, notwithstanding employment of the approved methods heretofore in vogue.

Report of Committee of the Boston Society for Medical Improvement on the alleged dangers which accompany the Inhalation of the vapor of Sulphuric Ether.—Boston is still haunted with the ghost of the Letheon—the "hub" is still exercised in perpetual revolution about anæsthesia, its pet child, though it found its advent to the amphitheatric atmosphere in the questionable guise of a secret compound, under the joint and several proprietorship of Dentist Morton, of unhappy fame, and Prof. Jackson, of large chemical and Lake Superior experiences. The report culminates as follows:

The general conclusions which have been arrived at by your Committee may be summed up as follows:

1st. The ultimate effects of all anæsthetics show that they are depressing agents. This is indicated both by their symptoms and by the results of experiments. No anæsthetic should therefore be used carelessly, nor can it be administered without risk by an incompetent person.

2d. It is now widely conceded, both in this country and in Europe, that sulphuric ether is safer than any other anæsthetic, and this conviction is gradually gaining ground.

3d. Proper precautions being taken, sulphuric ether will produce entire insensibility in all cases, and no anæsthetic requires so few precautions in its use.

4th. There is no recorded case of death, known to the Committee, attributed to sulphuric ether, which cannot be explained on some other ground equally plausible, or in which, if it were possible to repeat the experiment, insensibility could not have been produced and death avoided. This cannot be said of chloroform.

5th. In view of all these facts, the use of ether in armies, to the extent which its bulk will permit, ought to be obligary, at least in a moral point of view.

6th. The advantages of chloroform are exclusively those of convenience. Its dangers are not averted by its admixture with sulphuric ether in any proportions. The combination of these two agents cannot be too strongly denounced as a treacherous and dangerous compound. Chloric ether, being a solution of chloroform in alcohol, merits the same condemnation.

It is clear that Boston cannot abide chloroform, although Dr. C. T. Jackson, one of the Committee, permits under qua-

si protest the use of a mixture of four parts ether and one part chloroform, as more convenient from lessened bulk for army purposes. We apprehend that notwithstanding the labored argumentation of the Committee that chloroform will still maintain its complete ascendency in general and army practice, as we most steadfastly believe it ought.—That the proposed mixture with ether secures no real advantage save a more gradual introduction of the chloroform into the system, a result which can more readily and pleasantly be secured by appropriate manner of exhibition. That in a large proportion of cases anæsthesia cannot be secured by ether without great expenditure of time, distress to patients, annoyance to attendants; excessive amounts of the vapor;—local irritation of the respiratory passages, rarely experienced from chloroform; a disordered state of the nervous system which retards recovery in a marked degree, and finally when anæsthesia is secured the danger from ether is no less than that from chloroform. An analysis of the real causes of reported death from chloroform according to the methods adopted by our Boston friends with reference to those reported from ether, would unquestionably largely diminish the proportion supposed attributable to the anæsthetic. The *post hoc ergo propter hoc* argument has been admitted to a most unreasonable extent. Before the introduction of any sort of anæsthetics surgical patients occasionally died in the most unaccountable manner, after comparatively slight operations.—All such cases are now incontinently charged upon the anæsthetic employed. But even with this disadvantage, anæsthetics have steadily urged their way into general use, and chloroform ranks the column. We opine that the present onslaught will not materially lessen the confidence of the profession in its right to the position.

Quinine as a Prophylactic in Malarious Diseases.—Medicine in several respects is quite like theology. It has been complained that all creeds and opinions can prove themselves

orthodox, by judiciously selected texts from the bible; and so vast a number of medical reasoners can prove their positions right, to their own satisfaction at least, by a series of facts which everywhere are floating loosely in their neighborhood.

Just now the whole nation is agog about the war, and a great number of professional gentlemen with the rest are anxious to do something for the army. Prominently among the things proposed is that the grand army as it moves southward, shall be guarded from the malaria which does there abound, by daily ingestion by each individual of some five or more grains of quinine, and true to the method of reasoning suggested above, abundant instances are adduced where quinine has been in like manner taken as prophylactic with satisfactory results.

Let us look at the matter in an economical point of view at the outset. Of the army of five hundred regiments, it is a moderate estimate that one half will, if the war continues, be moved into the realms of Dixie and malaria, so that the prophylactic will be in daily requisition. Five grains to each person connected with a regiment, not including camp followers, teamsters, etc., will involve the use of, (in round numbers) ten ounces of quinine, or more exactly, about eleven of the ordinary ounce bottles, or for the two hundred and fifty regiments requiring its use, two thousand seven hundred and fifty bottles *per diem!* But discard seven hundred and fifty bottles for failures in exhibition, hospital patients, recusants, spiritualists, homœopathists, etc., and there still remains a nett 2000 bottles of quinine with all its well known imperfections on its head, to be purchased by the Government to be forced down the throats of our brave soldiery, *nolens volens.* And this to be continued eight or at least six months in the year—say three hundred and sixty thousand bottles. At the necessarily enhanced price of the article, the cost to the Government would fall little short of a Million of Dollars. Such an expenditure is not lightly to be made, to say the least of it.

It is scarcely more than a dozen or fifteen years since the doctrine was largely entertained in the malarious regions of the west that malaria penetrated and pervaded all things as a subtle poison, that it was held in solution in the water, suspended in the atmosphere, lurked in the finest roast of meat, and laid in ambush in the wholesomest looking loaf. All constitutions were impressed by it, and all diseases modified by it. To this wholesale assumption another was brought as a fellow, that Quina is the antidote to malaria wherever concealed and however manifesting its noxious influence.—The practical result was that all the adults took quina with their morning coffee, and the children with their bread and milk. History records its immense consumption and consequent enormous price. The writer has taken it daily for months in succession, with frequent recurring chills notwithstanding, until thirty grains became the ordinary and necessary anti-periodic dose. Scores and hundreds of western practitioners have seen its eventual failure as a prophylactic, and the rapid tolerance established. Quina is still largely and generally used, but with discrimination and judgment, and not under the guidance of the malarial and antidotal dogma. The rule now is Quina for the emergency—the paroxysmal development—other tonics and regimen for prophylaxis. The best of all prophylactics is good health, to be maintained by appropriate hygienic measures. So long as good health is present, there is little danger of attack by any of the multiform varieties of so called malarious disease. But let the causes of debility operate, and during the hours of depressionthe ague and its congeners are potent for evil. Comfortable clothing, dry feet, regular and sufficient sleep under shelter, good digestible food regularly eaten, a pint of good coffee both before and after standing guard; judicious medical attention to the condition of the digestive organs, and to occasional diseases—these and similar obvious methods will prevent more outbreaks of malarious disorder, than any mere medical prophylactic. Does not the medical profession yet

see that the larger portion of its duty is not exhausted in inventing new drugs or the revival of obsolete methods of exhibition of old medicines?

Ethical.—An intelligent and respectable medical gentleman, whose diploma was received from one of our best Colleges, and whose claims to due professional recognition are further endorsed by letters from such eminent gentlemen as Prof. Pope, of St. Louis, has been for some time in reputable practice in this city. Somewhat startled by the peculiar tactics of a well known apostle of medical elevation and reform among us, he addresses to this journal a communication exhibiting the facts in a case of *consultation* (!) with said apostle, upon the 25th of October last. He somewhat mildly requests to know whether the apostolic course "is in accordance with the rules of Medical Ethics in this city—that it is not in conformity with Christian feeling, I am well aware."

The gist of the matter is that the apostle offensively ignored the family attendant, and insisted upon taking the case into his own hands, it being an obstetrical one, probably requiring, *to save the apostolic time*, instrumental interference. To obviate the degradation of a wrangle in the presence of the patient and friends, our correspondent, moved by the natural instincts of a gentleman, retired, leaving the apostle "master of the situation." He now appeals to the profession through our columns.

We prefer not to publish the communication, but present the facts as another leaf from the illustrated chronicles of medical elevation and reform. So many of the profession have submitted tamely to similar treatment from the same apostle, that we have lost faith in any general action. Our advice is, here and elsewhere: Never indulge in wrangling for right professional recognition in the chamber or house of the sick—it is unworthy of you as a gentleman; but, when next you meet the offender, compel him to apologize as becomes a gentleman; or, if he will not—we have no hopes of you, unless your thumb and forefinger become acquainted with his nose. *Verb. Sap.*

Hydrochlorate of Ammonia.—There is a remarkable similarity in the general effects of this salt and the Chlorate of Potassa. The Germans, especially, have long placed an estimate upon it as an alterative, which has surprised those who have not had considerable experience in its use. Lotions of varying degrees of strength of solution may, in the large proportion of cases, be advantageously substituted for the more expensive stimulating liniments usually directed. It thus forms a cheap and efficient rubefacient and discutient, well adapted for prescription in general prctice. In many forms of cutaneous disease, characterized by temporary improvement under the application of local remedies of a stimulating nature, it is particularly beneficial. Thus it is especially useful, both exhibited internally and employed externally, in connection with the arsenicals in treatment of original squamous affections, and where, in other varieties of tegumentary eruption, the furfuraceous surface is presented. Acne is often well controlled by its local application. As a discutient of slow glandular enlargements, it may rank with or next to Iodine, and has the advantage that it does not discolor the part of application.

As an alterative, liquefacient, resolvent, or promovent of cell and tissue metamorphosis, it is worthy of the high rank which our German confreres assign it—ordinarily improving digestion and renovating the secretions in a marked degree. Western practitioners, who have had much experience with it, given in full doses, in combination with Quina, assert that the system is left in a much better condition than when the latter is given singly, and that the necessity for administration of mercurial and other cathartics is very materially lessened or altogether removed.

The same peculiarities fit it for valuable exhibition in many obscure neuroses, where defective irregular innervation is the prominent symptom. We beg leave to recall the attention of the profession to this old remedy, as well worthy more frequent trial than it now receives, sensible, as we are, that, under judicious use, it will by no means as frequently disappoint in result as many newer and more fashionable medicines.

The Army Examining Board.—We are gratified at ascertaining that two of the members of the Examining Board, whose names we have not at hand, have been appointed Brigade Surgeons. The remaining three, it is announced,

are appointed to the volunteer service of this State, with the rank of Majors. It is understood that the Legislature, during its next session, will legalize this appointment by the Governor, it being supposed to be the most economical method of providing for the payment of the Board. We regret to hear that the gentlemen composing the Board were somewhat annoyed at some remarks of this journal, in a previous issue; but congratulate ourselves that the appointment received from their gubernatorial patron may console them for such merely cutaneous inflictions. We trust that the harness of military rank may render their tegumentary tissue slightly more pachydermatous.

We are gratified in being able to announce that, by a coincidence of a remarkable character, since the appearance of our little paragraph before referred to, the examinations conducted have been of a much more practical sort, as well as more generally thorough upon those details which really require familiarity. We willingly award the merited meed, and will not detract from its radiance by claiming the slighest credit in the premises. Selected, as this Board was, by a non-professional man, irrespective of any general or individual expression of the profession, it is really quite remarkable that political and personal considerations should have permitted so capable a company of gentlemen to occupy so responsible a position. One or two of the physicians composing it, with whom we have had the honor of acquaintance, we are willing to endorse as everything desired in the post, and we sincerely trust that their eminent good nature (impervious even to the little pinch of the squib aforesaid,) may not allow them to approve candidates they do not find to be worthy and well qualified. We are, indeed, assured they will not, for we believe them fully alive to the importance of their position, and though perhaps occasionally a little sensitive to emotional influences, nevertheless thoroughly patriotic at heart.

Army Med. Appointments in Michigan.—Gov. Blair has exercised the appointing power vested in him, by selection of gentlemen of the most marked ability. We scarcely know of an instance where Michigan has Surgeons in the field but what are of the very cream of the profession. We are led to these observations by the recent choice of Dr. J. Andrews, of Paw Paw, a gentleman of high distinction, varied knowledge and large experience, as Surgeon to Col. Kellogg's Cavalry

regiment, recently sent into the field of action. Michigan soldiers will not fail of excellent professional treatment, whatever their fortunes before the enemy or unaccustomed climate. Honor to Gov. Blair.

Notice to Subscribers.—A very considerable number of our exchanges have been compelled by the stringency of the times to suspend publication. Others have run in debt, hoping for better times in future to enable them to meet their liabilities. This journal has done neither, nor will it suspend or run in debt whatever the times. But some little irregularity of issue has been necessitated by the small proportion of receipts to expenditure. Our subscribers must pardon us this, as it will be seen to be dependent more upon them than upon us. There are large arrearages upon our books, and a large list of subscribers, but these have not paid the printer, paper-maker or binder, these have been mainly paid from our own pockets. Early in the year, during the decline and fall of Illinois and Wisconsin currency, our receipts were nominally considerable, but our losses upon bills received were very large by their depreciation, nevertheless we credited the major part at par. We have a goodly list of paying subscribers, and for the benefit of these, having determined upon prompt issue of each monthly number, we have concluded, it must be confessed with reluctance, to erase from our mail list a great number of names whose accounts have remained unadjusted year after year. Justice to paying subscribers and to ourselves demands this, and all interested will please to take due notice. We shall then take such steps as seem feasible for the collection of each of these old bills. Meanwhile, we request prompt transmission of all arrearages, whether of recent or long standing.

Books for Sale.—Any one wishing to procure a full set of the "American Journal of Medicine and Collateral Sciences," Edited by I. Hays, M. D., Philadelphia, from Jan. 1st, 1847, to the close of the present volume, 1861, well bound and in perfect preservation; or the "London Lancet," American reprint, from Jan., 1847, to 1855; or the "Boston Medical Journal," '47 to '57; or the first twelve parts of "Braithwaite's Retrospect," all well bound and in good order, can procure the same, at low figures, by application to the Editors of this Journal, or addressing a line to box 4458 Chicago P. O.

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